Issue 137 • 22nd June 1991 • 88p

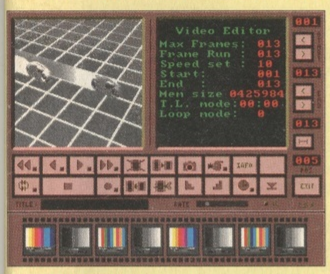
TONS OF TIPS FOR YOUR MACHINE

see pages: 16-27, 30, 32-33, 44-45...

NEW COMPUTER EXPRESS

FIRST NEWS • FIRST REVIEWS • BEST BUYS • YOUR WEEKLY GUIDE

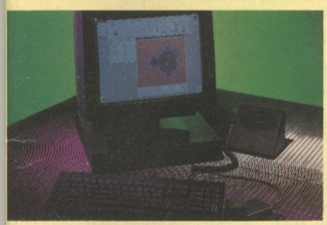
AMIGA



NAKED VIDEO

Datel's stunning new Digitizer II on test

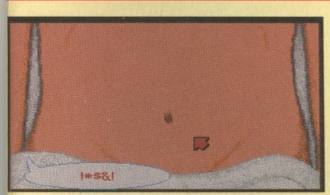
NeXT



BLACK POWER

Is this the sexiest machine ever made?

GAMES



LIFE & DEATH

Virtual surgery comes to your Amiga & ST

SEGA'S SUPER MEGADRIVE!

Why this top secret Mega-CD will smash Nintendo's Famicom

Full story pages 4&5

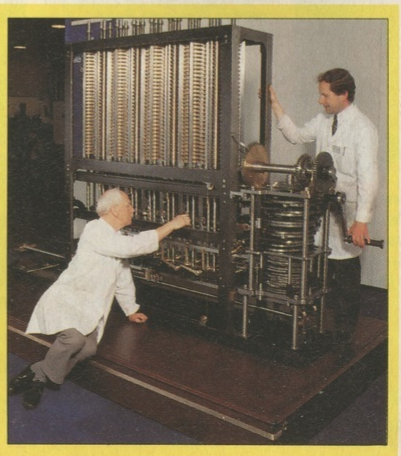
PLUS: IBM'S 12 NEW PCs

AND there's DOS 5 and a notebook too!

SPECIAL REPORT!

THE DIFFERENCE ENGINE

A Victorian computer is brought to life – p55



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future PUBLISHING Your guarantee of value

Frontend

Just what is going on out there in the big wide world of computing? And where do you find it in bite sized chunks? Why here of course. It's in Frontend first!

SUGAR BID TO SAVE SPURS

It was confirmed this week that Alan Sugar is to invest some £12 million of his own money in a rescue bid for troubled Tottenham Hotspur football club.

• Terry Venables is joining forces with Alan ' Suzza ' Sugar in order to save ailing Spurs from receivership. Will this move reap even larger rewards for Amstrad?

Sugar's bid, for the club, which his father took him to see play as a child, is expected to be made in collaboration with Spurs' manager Terry Venables. There are two aims: first, to pay off Spurs' £11 million debt to the Midland Bank. Second, to wrest control of the club from Paul Bobroff, ex-chairman of the Tottenham holding company, and Irving Scholar, the club chairman. These two men have a 37 per cent share in Spurs.

Sugar, ever reticent to talk to the press, was unavailable for comment. A spokesperson for Tottenham Hotspur was equally tight-lipped. A wall of silence also met enquiries to the office of Nat Solomon, chairman of Tottenham Hotspur PLC.

There is no doubt that Sugar has the money to back up any such deal. According to a *Sunday Times* survey, he is the 46th richest man in the UK, with a personal value of £157million.

Computer companies and first division football already have a good relationship. Sharp sponsors Manchester United, NEC sponsors Everton, Brother is linked with Manchester City, Tulip with Crystal Palace, and Commodore has strong ties with Chelsea.

The benefits to Sugar of buying into Spurs could be immense. According to Commodore's press and public relations manager Alan Ball: "Shirt sponsorship means your company name is on national television and in the press nearly every week." ■

Computer industry watchdog, Federation Against Software Theft (FAST), *• If you're thinking of flogging some illegal software in the near future. You had better think FAST.*

Make a FAST bust

has been hard at work once again. In a week of action against software pirates, FAST made 16 raids in the UK and netted 10,000 disks.

The busts took place in Cleveland, Humberside, South Wales, at a car boot sale at Redcar races, and in Cardiff where the biggest single haul of 5,000 programs was made.

All of the programs confiscated in the raids were described as 'leisure titles' for most 8-bit and 16-bit machines. ■

Shelter offers pet solution

In these hectic days, when the canine is becoming more of a walking anti-personnel mine rather than man's best friend it, is good to know that computers can help.

The Wood Green Animal Shelter in London has set up the National Pet Register to keep track on dogs. The system has the capacity to maintain records on 80 million dogs. People wishing to be registered pay a £5 fee, £2 of which goes towards insurance. Details of the pet – both dogs and cats are covered – and the owner are then entered on to the computer.

The animals are then given registration tags which bear the telephone number of the shelter. Then if the pet goes missing, the person who finds it can telephone the centre which will either pass the details on to the owner, or will give the address of a person who will look after the dog or cat until the owner is traced. ■

• £5 will cover you and your pet from loss or damage – just who the damage could be done to is another question.

DUTCH A DAM SHAME

Phone 'phreaks' in Holland have come up with a way of making international calls for free. And they've even published the details in a magazine titled *Hack-Tic*.

The method relies on special telephone numbers, available in several countries worldwide, and provided free of charge for people away from home wishing to make use of the operator in their own country.

Phreaks dial the free number, wait for the 'clear forward' tone to sound and then intercept it before the operator answers by using home-made electronic 'blue boxes'.

Once the signal has been intercepted, another 'terminate' signal is sent, followed by a 'seize' signal from the box. This allows phreaks access to the lines, thus enabling them to call anywhere in that country.

The computer at the exchange meanwhile is under the impression that a legal conversation is going on between the caller and the operator. ■

GET REAL! • GET REAL! • GET REAL! • GET REAL!

STRESS SENSE

Stressed-out pilots will be benefiting from a new Artificial Intelligence (AI)-based system which uses Ultrasound to measure the flow of blood to the brain. If untoward changes are noted in this flow, then decision making is transferred to another member of the crew.

LABOUR'S COMPU-NUNDRUM

• Neil Kinnock's Labour party may be doing well with the public in the polls, but its members are not too pleased with the way Labour's main computer is handling their own internal affairs.

Labour MPs are hopping mad over the antics of a rogue computer based at the party's Walworth Road headquarters in London.

The maniac micro, which is at the centre of the National Membership Scheme and used in recruitment and membership co-ordination, lost the details of potential Labour supporters. To compound this error, the computer 'left' numerous cheques uncashed.

Waiting list

The mistakes came to light when a number of local Labour party members contacted the headquarters to complain of a six-month waiting list for membership cards.

Labour's computer system was installed in 1989 to pep-up flagging membership numbers following its 1987 election defeat.

Since then Labour support has risen from 260,000 to 310,000 members.

However, there is a growing feeling among party supporters that the number could be a good deal greater if the wayward computer was not causing so many unnecessary delays. ■

SHOOT FROM THE LIP

● "Commodore has given out misleading information. They would have to come to Kodak for more information on Photo CD. Their system (CDTV) cannot play Photo CD" – Sandy McKenzie of Philips Multimedia commenting on Commodore's claims that CDTV is to be Photo CD compatible. Interestingly, Philips is collaborating with Kodak on the Photo CD project.

● "2.8Mb is double 1.44Mb. And if tommorrow you were twice as high as you are today that would seem to be a significant advance". So said Bill McKraken of IBM, telling tall tales?

● "It breaks down the boundary between reading and writing". Mark Bernstein, chief scientist of American firm Eastgate Systems, commenting on the *StorySpace* hypertext tool for the PC.

Football sweetener • BT phone home • Party problems

HATE-filled giveaway scoop special

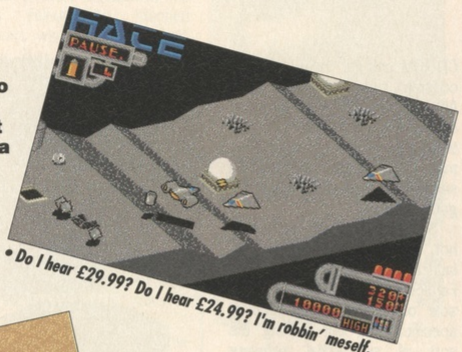
EXPRESS GIVES THE GAME AWAY

In a remarkable publishing coup, *New Computer Express* next week becomes the first weekly magazine in the history of the world to offer its readers a full game – probably

Next Thursday, along with your weekly guide packed to the proverbials with first news, first reviews and best buys, you'll also find *HATE*, a brutally addictive game for both the Amiga and the ST.

DON'T DELAY, ORDER YOUR COPY TODAY

The last thing we want is for our regular readers to miss out, so fill in the form on page 58 right now.



• *Do I hear £29.99? Do I hear £24.99? I'm robbin' meself...*

• *The bargain of the year: HATE, plus Express, plus playing guide, plus cheats – all for just £1.50. The best thirty bob you'll ever spend!*

● **And inside the magazine there's a brilliant playing guide (and even a set of cheats!) that'll help you get the most from your complete game.**

Remarkably the whole deal will set you back just £1.50. We reckon that's the best bargain since the United States bought Alaska from the Russians for ten cents and a bag of spuds.

● **So reserve your copy right now. There's a form on page 58. We expect this issue to sell out by about lunchtime on Thursday, so don't come crying to us saying you weren't warned. See you next week!**

• *HATE: a brilliant magazine, a complete game and a playing guide and set of cheats, all for £1.50? Is this some kind of a wind-up? No siree, it's merely an Expression of our unbounded generosity.*

Funtabulous 16-bit bargain offer

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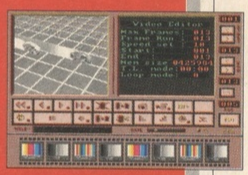
Sega's Secret New Megadrive
The whole world's going crazy over CD and tomorrow's consoles are changing. Is the new Sega the most future-proof option for you?
– see pages 4&5

REVIEWS

The NeXT is finally here – has it been worth the long wait?

A 68040 chip, 400Mb harddisk and more than Jean Paul Gaultier - but is it for you? – page 49

Sick of the flicker?
The cheapest way of making your Amiga look a whole lot better – page 52



EVERY WEEK

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All the top stories – pages 4-8

What's New
Brilliant photo manipulation software, super VGA monitors, tiny 486 motherboards and 386 notebooks – page 11

Games Week
Hot tips and news, plus *Life&Death* review – page 50

Attention! Amiga and ST owners
HATE is the name of the game. And it could be yours. Turn to page 58

SHOPPING EXPRESS

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Mega-CD, Super Famicom, Neo Geo and PC Engine – as the latest consoles

DOES THE CD CONSOLE

While the competition between CDTV and CD-I may be the more familiar battleground of interactive Compact Disc, the war between console manufacturers is also breaking into the CD-ROM market. So, as Sega announces its new Mega-CD system, *Express* takes a close look at the increasingly serious side of a hardware industry based on fun...

After revealing its new Mega-CD system to selected journalists at Chicago's CES show two weeks ago, Sega finally unveiled the machine at Tokyo's Toy Fair last week.

Designed to sit beneath the Megadrive, the CD add-on is expected to sell for £199 when it is released in the UK later this year. A spokesman for Sega's UK distributors, Virgin Mastertronic, International director Barry Jafrato, told *Express*: "It won't be shown at this autumn's CES show, however limited numbers will be available before Christmas and it is possible that it will be launched here in the first half of next year".

The Mega-CD runs standard 5-inch compact discs each capable of storing 540Mb of data. A whopping 128K RAM cache allows code to be buffered into memory for fast screen updates, thereby making drive access appear seamless.

With software due to go on sale in Japan this October, 27 third party software developers have already announced they will be producing forthcoming CD titles for the unit. In addition, the drive opens up the interesting possibility of Karaoke titles.

Sega is simultaneously releasing a Mega Modem and Mega Video which can be interfaced to the new system to offer users 'sing-a-long-a CDs'. Using the modem to download the latest hit songs from a Sega database, the code could be stored using cartridge back up devices like the Sega Doctor, currently only available in Japan.

Sega's Mega-CD has been expected since the original launch of the Megadrive which coincided with the release of a CD-ROM unit for the PC Engine console by arch-rivals NEC. Although the PC Engine is based on 8-bit technology, sufficient titles found their way to CD format to make the medium a serious contender in the fun and games stakes.

Sega's announcement comes hot on the heels of the US launch of Nintendo's Super Famicom, another 16-bit console offering superior techical specifications, but lacking the sort of substantial software availability Sega has managed to attract for the Megadrive over the last 18 months.

Indeed, Sega has more than a longer market presence to its advantage.

Both the US and Japan are relatively bereft of the 16-bit games programming talent readily available in Britain and the rest of Europe with exclusive development contracts secured by the major coding teams. As the PC Engine has no official European presence and the new Nintendo Famicom won't arrive here until at least this Christmas, Sega will be confident it can further clean up in both hardware sales and development contracts.

• Sega's Mega CD – not launched officially anywhere outside of Japan. The games industry denies all knowledge, but Express breaks the story.

Why the consoles and Compact Disc had to combine • Screen to

News of Sega's Mega-CD confirms the logical next step in the evolution of the games console. Data storage and speed of access rather than increased processor power are the new angles being taken by the manufacturers.

The market is not a new one, it dates back over a decade with the release of Atari's VCS2600 in 1979.

In 1980 the estimated value of the market was £183 million worldwide. Today this stands at an estimated £2.2 billion. This figure is made more astonishing by the fact that the mid-80s saw the value more than halved from a peak of £1 billion to around £400 million.

Atari, still selling its consoles, was severely damaged by this state of affairs. In fact it had not bothered re-entering the market until last year with the Lynx, and this year with leaked news of the 64-bit RISC-based Jaguar machine.

The current console arena is hotly contested by the Japanese duo of Nintendo and Sega, with other players such as NEC, Atari, SNK, and Commodore also competing for market share. The main contenders for console kingship are detailed below.

Neo Geo from SNK (marketed by DGM Ltd in the UK)

PRICE: £299

This was the 'hey wow!' launch of 1990. The specifications of the Neo Geo are stunning, but unfortunately so was the price tag of £450 until news just in as we went to press of the official launch and price cut to £299 in the UK. This combined with the fact that less than 20 games are available for the machine and they cost upwards of £100 has made the Neo Geo a console for collectors and real enthusiasts. It is a sleek black peice of hardware which looks more like an executive desk accessory than a toy.

• Neo Geo from SNK

PROCESSOR(S):	Z80 and 68000
COLOURS:	65,535 - 4,096 on screen
RESOLUTION:	640 X 200
MEMORY:	132K
SOUND:	Stereo 15-voice chip array

Megadrive from Sega

PRICE: £179

The Megadrive is the most widely available 16-bit console in the UK. Launched in the UK last September it has already sold over a million units worldwide.

Sega has tied up software agreements many major UK developers, most notably Electronic Arts. It also has licensing agreements with Walt Disney (*Mickey Mouse*). Sega is taking its competition with Nintendo extremely seriously, some might say personally. The latest Megadrive title, *Sonic the Hedgehog* has been publicised not just as an all-singing all-dancing 16-bit game, it is theoretically a *Super Mario Brothers* beater.

PROCESSOR(S):	68000 and Z80
COLOURS:	512. 64 on screen
RESOLUTION:	32 X 224
MEMORY:	138K
SOUND:	Stereo, 12-voice FM chip

PC Engine/Turbo Grafx from NEC

PC ENGINE £200. TURBO GRAFX: £300

Still not officially available in this country, the 8-bit PC Engine and 16-bit TurboGrafx, is the only other console available which makes use of CD-ROM technology.

Priced around the £200 and £300 mark respectively, from grey importers and some independent dealers, the PC Engine was deliberately held back from the UK and European markets by NEC. The reason for this was put down to poor US sales in 1990. However, it is rated as one of the hottest properties in the console world.

PROCESSOR:	Zilog(Z)80
COLOURS:	PC Engine 512. TurboGrafx 4,096 (32 on screen)
RESOLUTION:	256 X 216

COVER FEATURE

are lined up for the lucrative leisure market, *Express* asks:

WAR START HERE?

Console confusion and corporate politics

Sega's Mega-CD console is not going to have the market to itself. Its arch-rival, Nintendo, is also planning to enter that arena.

However, confusion and corporate politics are rampant around the Nintendo camp in terms of a CD-based console launch.

Japanese consumer electronics megalith Sony had announced that it and Nintendo were to develop a CD-console called the Play Station. However, Nintendo feels differently about this, and has publicly denied that it will support the project. The most obvious sign of this discord was the signing of a deal to develop a CD-XA system with Philips at Chicago's Consumer Electronics Show (CES) three weeks ago.

Nintendo America's president, Howard Lincoln, announced the Philips link-up to stunned observers who had been awaiting the Play Station news. The only comment forthcoming from either Nintendo or Philips on the matter was that Sony would continue with the Play Station, but would not be supported by Nintendo.

The Philips/Nintendo deal was signed and sealed overnight at the CES. Although it concentrates on the CD-I (Compact Disc Interactive) side there are definite signs that a console collaboration is in the offing – possibly in the form of a cut-down CD-I style chipset available at low cost. A major signpost here is that for the first time in its history, Nintendo has released the licence for its hugely successful *Super Mario Brothers* game to Philips.

Only time will tell, as Nintendo and Philips are remaining tight lipped about the entire affair. ■

• Howard Lincoln of Nintendo stunned observers at Chicago's Consumer Electronics show with the annoucement that his company were to develop CD technology with Philips not Sony.

Speaking to UK trade weekly *CTW*, Sega's US President, Tom Kalinske claimed "the new CD-ROM system is technically superior to any other system on the market", concluding, "Sega will lead in CD-ROM just as the Megadrive leads the 16-bit market". Meanwhile Sega UK is remaining quiet about the new launch, preferring to concentrate on the marketing and development of hand-held Gamegear and maintaining the market presence of the existing Megadrive. ■

EXPRESS COMMENT

SEGA VERSUS NINTENDO

It's always been an intriguing battle and one in which Nintendo always seemed to have the upper hand. The MegaDrive versus the Super Famicom. The Sega Mega-CD versus the Play Station. Who will win?

We really need to re-define the question. Right now, outside of Japan, it is the MegaDrive versus the NES. 16-bit against 8-bit and historically we know which format will win that one.

Nintendo has only just launched its re-badged 16-bit Super Famicom (called the Super NES in America) to the Western world. Sega has been there for a year and now has an estimated one million users. In the United States, which is the springboard into Europe and the burgeoning Eastern European markets, Sega is holdng an extremely firm and positive position.

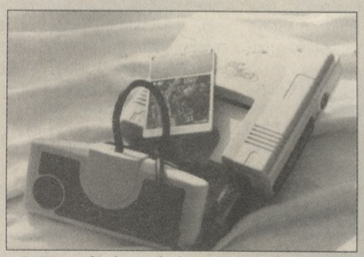
Nintendo's plans for a CD system have been thrown into disarray by its switch from Sony to Philips (see Nintendo do what Sega don't?). Not only that, but for the first time in its history Nintendo has released the licence to its all-conquering *Super Marios*. Why? Was it pushed or did it jump? Has Nintendo suddenly been forced to realise that 8-bit supremacy is not going to forge the future, but that hardware evolution and communication with other companies are the keys? Who knows?

Sega's Mega CD has two major advantages over any likely competition; it is available now, and it can make use of the MegaDrive's16-bit market share (estimated at 75 per cent in the US). This last factor is massively important in a recession-hit world where consumers are being forced to make the most of what they have, rather than junking it in favour of the latest marvel.

If Sega can actually get its Mega CD into the shops outside of Japan, in time for the Christmas market and at a sensible sub-$250 price tag, then the $199 Super Famicom could be looking quite sick. But Nintendo has one Big Thing going for it. CASH. Absolutely truck loads full of the stuff.

So, while the Mega CD may well smash the Super Famicom, unless Nintendo turns its corporate vision away from its history, the 8-bit ghetto, and its inability to communicate with the rest of the world, the console war could yet be won by the sheer financial muscle of the world's largest computer entertainment company. It may well be that in the final analysis, it's not your pedigree that counts – it's your last product. But if you have billions of dollars at your disposal when the going gets rough, you won't find it too difficult to get tough. ■

to – the hottest consoles on the block



• PC Engine/Turbo Grafx from NEC

MEMORY:	PC Engine 72K RAM. Turbo Grafx 160K
SOUND:	Stereo six-voice chip

Super Famicom (now rebadged outside Japan as the Super NES) from Nintendo.

PRICE: APPROX £199

Nintendo has held back from the 16-bit console market outside its home turf, with the Super Famicom only being launched in the United States three weeks ago. This is a year after Sega's Megadrive launch.

However, the Super Famicom is generally accepted as being a highly desirable piece of console kit. Nintendo is ensuring this with advertising copy which reads: 'Other so-called 16-bit consoles are only warmed up 8-bits'.

It is known that software developers in the UK are working on products for the Famicom, however none of these people are prepared to talk about any of the details. Whether this is due to non-disclosure agreements or pure lack of knowledge is debateable. However, one thing is certain – the UK will not get an official launch of the Super Famicom until at least 1992.

The burning question in the console war, however, is whether or not Nintendo can support the Super Famicom with a suitable CD-ROM drive before Sega manages to consolidate that area. Plans are afoot.

PROCESSOR(S):	Nintendo proprietry 16-bit chip
COLOURS:	32,768. 128 on screen
RESOLUTION:	256 X 224 or 512 X 448
MEMORY:	132K
SOUND:	16-channel digital stereo

• Super Famicom from Nintendo

Should you buy a hi-fi CD player?

The emergence of CD-ROM players for 16-bit machines – owners of STs, PCs, Arcs and Macs can buy readily available off-the-shelf units while Amiga owners need only wait until September, means that music afficionados would be better off buying one of these rather than a dedicated CD player. For why duplicate your costs when you can buy a box for around £300 that will interface both to your machine and to your hi-fi?

Every CD-ROM player has a pre-amplified headphone output which can be directly connected to your system. Of course, it all depends on the level of quality you expect from CD sound. Today's state-of-the-art hi-fi system players may offer multi-disk carousels, bit stream processing and digital output, but even the cheapest CD-ROM devices invariably offer bitstream. To *really* hear the difference in quality between a typical CD-ROM and a high street CD player you'd have to spend about £2. This would buy you one of those hi-fi magazines which would con you into thinking there was a difference. ■

NIBBLES

Amstrad offering

Amstrad is launching a version of its 3386SX with a 40Mb hard disk. Announcing the machine, Amstrad's sales and marketing manager, Malcom Miller, said: "The machine is designed to increase sales in the corporate and public sector". The basic unit costs £1,761. A version with VGA monitor costs £1,996.

Going down

Kyocera has cut prices on selected laser printers by more than £1,000.

The standard F-2200S comes down from £3,490 to £2,290. The 18 pages per minute and the single bin versions move from £3,350 to £2,290, while the dual bin F-3300 falls from £4,290 to £3,650.

Commenting on the changes, Kyocera's marketing communications manager said: "We naturally view our price reductions as a positive move towards gaining ground in a highly contested market".

For more information call 0734 311500.

DOS day out

The launch of DOS 5 means that people have to get used a new operating system when some are only just getting to grips with the last version. To this end, the IBM PC User group is running half-day workshops for DOS 5 training. Not only do you get expert advice on the new PC operating system, you actually get a free copy of it thrown in.

The workshops cover installation, functionality, and problem solving. Each class will consist of a maximum of six people. The cost for non-members of the group is £116.

For more information call 081-863 1191.

Pay day blues

A survey carried out by Computer Economics claims that programmers, and other computer-related staff, saw their pay rising by an average of 8.5 per cent last year.

This is the lowest increase since 1987 and is accompanied by a fall in the number of resignations. The survey also pointed out that trainee programmers could expect to earn £10,750 in the first year, £12,300 in the second, and £15,000 in the third year of employment.

Amiga video views

Three new Amiga video devices have been launched by Derby-based Syntronix – for editing, recording, and digitising.

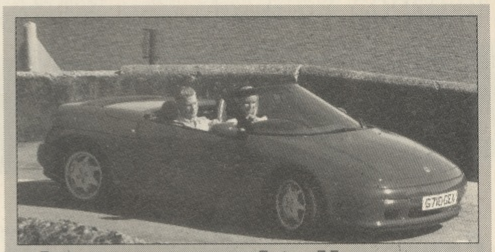
The Editman which works from a mouse-driven software interface is capable of controlling domestic video and Camrecorders, according to the company. Functions include Insert and Autodub. IFF format files can be edited with no need for additional genlocking.

An RGB to S(Y/C) recording interface is next up. Once again, the claims are grand: 'Recording quality surpasses that of S equipped genlocks which are an unnecessarily expensive alternative that can be avoided'.

The third device is an RGB digitising interface. This is capable of 'grabbing' frames from video in real time.

The Editman costs £584.44, the recording interface £293.95, and the digitiser £234.94. The products are only available directly from Syntronix on 0332 298422.

The reason for this, according to MD, Gerry Jara, is: "We're not happy about the retail trade. They are not set up to deal with the 1990s. Customers know more about the products than the shops do." ■



The Lotus challenge

Lotus Turbo Challenge II is due to hit the streets in October. The previous version of this racing simulation was rated as one of the best games of 1990.

Version II includes: one to four player modes, four machine links for simultaneous play via modem, varying weather conditions from rain to fog, and a choice between the Lotus Elan or Esprit cars.

The games will be available for both the ST and the Amiga. No price has been announced as yet. ■

Acorn leaps into PC market with sub-£100 emulator

ARCHIMEDES PC

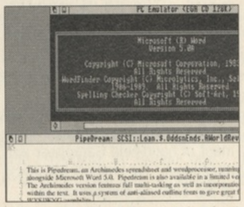
by Paul Lewis

Acorn computers has upgraded its PC Emulator for the Archimedes. The Arc can now run IBM PC software in a window on its desktop, and store it on a hard disk.

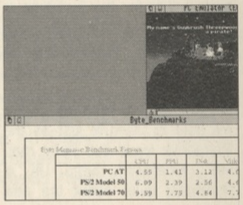
Even Acorn does not pretend that an Archimedes with the emulator is a substitute for a dedicated PC. However, it does extend the range of software available to Arc users. The PC market is far greater, and cheaper, than the younger Arc.

The new Acorn PC Emulator replaces the original version which was widely criticised for being very slow, only emulating CGA graphics and not running in a window under the Archimedes desktop operating system (OS), Risc OS.

The new version 1.6, released this week, runs exactly like other Archimedes applications.



• Microsoft Word 5 and Pipedream, an Archimedes wordprocessor, running together.



• Return from Monkey Island and an Archimedes spreadsheet running alongside each other.

However, data can be now transferred from PC packages into native Archimedes applications by simply dragging an icon around the desktop.

The software now emulates Enhanced Graphics Adaptor (EGA) graphics and runs most major PC packages such as Microsoft *Word*, Lotus *1-2-3* and *The Secret of Monkey Island* adventure game.

A special mode, EGA+, enables it to cope with a lot of software that would normally demand VGA graphics. Under EGA+, even Microsoft's new graphic user interface (GUI) Windows 3 and compatible products will run.

In order to store the PC-compatible applications, and files, Archimedes users who have the emulator can create a PC partition on their hard disk. This appears in the form of a file on the desktop. A separate utility called MultiFS, licensed from Arxe systems, enables the Arc to treat this file and its floppy disk drives as MS-DOS equipment with which to format, load and save MS-DOS files. Once the partition has been made, and the system configured, all the file and disk housekeeping can be carried out even if the PC emulator is not running.

The performance of the new emulator is somewhat disappointing, however, in that on an ordinary Archimedes it runs at about the speed of a PC XT with an 8088 processor (approximately 8MHz). On an Archimedes with the ARM3 version of its main processor it achieves about 2/3 the speed of an AT 80286 machine (8-20MHz). Games are tedious and mouse control can be jerky.

The Acorn PC Emulator 1.6 costs £99. The company is also running a deal with a £29 trade-in on the previous version. Call Acorn on 0223 245200. ■

Big Blue bites the Apple

Apple Computers and IBM held a meeting in New York earlier this month which would have been inconceivable two years ago.

According to the *Wall Street Journal*, the aim of the discussion was to lay the groundwork for '... an exchange of technologies that could change the balance of power in both the semiconductor industry and workstation market'.

The discussions concerned Apple using IBM RISC (reduced instruction set computer) technology in its next generation of machines, while IBM would gain a licence for Apple's highly respected operating system.

Apple has already held talks with two other major players in the RISC market; Sun Microsystems and Hewlett Packard. And, as *Express* reported in December 1990 (issue 109), it has forged agreements with UK-based Acorn computers on the same subject.

IBM could solve three problems if the deal comes to fruition. If Apple takes up an option to use IBM RISC, IBM's profile as a developer would rise. In return for RISC, IBM is likely to gain a licence to Apple's graphical user interface (GUI), a system which has won more friends and customers for the Macintosh range of computers.

The consensus amongst observers close to IBM, is that this would be added to IBM's O/S2 range of computers in order to bolster its flagging image.

Finally, and more importantly, IBM could move away from Microsoft. Indeed an unnamed IBM executive told reporters in New York: "It is no secret that our relationship with Microsoft is a marriage of convenience and that we are interested in lessening our dependence on Microsoft". ■

Atari closes Far East factory

In a move aimed at cutting manufacturing costs, Atari has been forced to sell its Taiwan-based manufacturing plant.

The company has signed deals with sub-contractors across the Far East. These companies will carry out the assembly work on Atari's personal computers. Certain, unspecified conditions have to be met before the $60m (£35m) sale can go ahead.

Atari spokesman, August J Ligouri, said that it evaluates strategy on a "country-to-country basis" and that the European market was "sluggish". ■

IBM PRESSES AHEAD

IBM's press launch at the company's South Bank offices on Tuesday 11 June was its first major event since it announced the PS/2 range in 1987. The most eagerly awaited news was that of Disk Operating System (DOS) 5, the successor to the widely criticised 4.01.

Other new releases include a series of mid-range 386SX machines, a 386 notebook, a rewritable optical drive and 50MHz 486 processor upgrade for PS/2 Models 90 and 95. In all, IBM heralded 13 new machines. How will they affect the market and will they further IBM's plans to dominate sales of personal computers? Read on...

CD OR NOT CD?

An external PC-compatible drive resembling a CD-ROM unit was one of the more innovative launches announced by IBM.

The Rewritable Optical Drive writes data to 3.5-inch magneto-optical disks rather than conventional CDs. The magnetos have 127Mb of storage space - the equivalent of 40,000 pages of text or 10,000 graphical images, compared to the standard 650Mb on a CD-ROM.

While CD-ROM is a read-only system, IBM's new drive and disk combination enables users to read or write information in the same way as a normal external floppy drive.

Although the system lacks the data storage capacity of CD-ROM, it makes up for it in terms of speed. Access time is claimed to be a sprightly 66 milliseconds – about four times faster than a CD ROM drive. The Rewritable Optical Drive is available next month at £1,109. ■

Bugged or brilliant? DOS

Microsoft's disk operating system (MS-DOS 5.0) is the long awaited upgrade to the heavily criticised version 4.01.

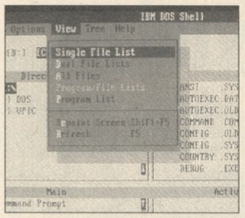
"This is the most significant event for IBM since the launch of the PS/2 range in 1987," said IBM Europe's general manager, William McCracken, at the press launch last week.

DOS 5 has a friendlier graphical interface (GUI), or 'shell', and like Apple's System 7, it also uses on-line help. There is also a half-way house between multi and single-tasking computing called 'Task Swapper'. This acts in a similar way to *Presentation Manager*, effectively suspending one active application so that another can be run or resumed.

• William McCracken, general manager of IBM Europe, reckons the release of MS DOS 5.0 is one of the most important events in the company's history.

The major enhancement is that it takes up less memory than its predecessor. The main criticism levelled at DOS 4.01 was that it took up so much memory that many larger programs, such as *Protext*, had problems running under the system. Many users complained it was also plagued by bugs and used a memory buffer system which had a tendency to trash hard disks. Such faults have made many users very wary of the new update.

DOS developer Microsoft, promises that the improved memory management of the new system has eliminated all these problems. Chairman of Microsoft, Bill Gates, is very confident: "We believe this is the largest launch of a PC software product in history."



• DOS 5 picks up where the derided 4.01 left off. The front end, which was seen as one of the more positive aspects of the older system has been retained, and according to both IBM and Microsoft it's also been improved. See for yourself.

Already, many leading PC manufacturers, including Apricot and Viglen, and software developers such as Lotus and WordPerfect have committed themselves to DOS 5.0.

In total over 130 manufacturers worldwide have licensed MS-DOS 5, which costs £69 for an upgrade and £99 for new users. ■

Super fast 486 upgrade

IBM announced at the press launch that it will be offering users of its 486-based PS/2 machines the chance to get 50MHz performance from their machines with a new upgrade card.

The card is compatible with the PS/2 Model 90 XP 486 and PS/2 Model 95 XP 486 systems. It features an Intel 50MHz microprocessor and includes an internal memory cache controller, an 8K memory cache and an integrated floating point processor.

The company also revealed that four new mid-range 386SX computers are to join its popular PS/2 range. It claims they offer faster processing, more storage capacity, expansion flexibility and portability than any existing machines in the range.

The Model 40 SX and the Model 57 SX are 80Mb, low cost, high performance systems, priced at £1,921 and £2,473 respectively. They are intended for standalone use and aimed at small and medium businesses. The Model 40 is available now, the Model 50 will be on the market in August.

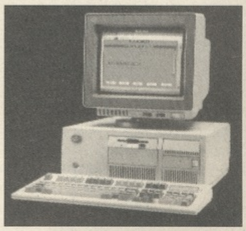
• IBM hopes the Model 57 SX will bolster its share of the mid range range 386 PC market.

The Model 35 SX, out now, costs £1,693 for a 40Mb version with 2Mb of random access memory (RAM). It has a small footprint and is primarily for use with such applications as database management and spreadsheets. A 35 LS network server terminal is also available for £1,658. ■

Late entry into notebook market

Possibly the most important machine to be announced by IBM was the N33SX notebook which fills a significant gap in the company's range.

This is a late entry in the market, companies like Compaq, Toshiba, Sharp and Viglen have already launched similar notebooks. With an A4 footprint and weighing 2.5kg, the N33 has a recommended retail price of £1,865.



• Remaining true to its history of following rather than leading personal computing, IBM has finally released a 386SX notebook into a market already overflowing with choice.

Standard features include a12MHz 80386SX processor, 2Mb of RAM upgradeable to 6Mb, a 40Mb hard disk, and a 3.5-inch 1.44Mb floppy drive. A Liquid Crystal Display (LCD) screen which supports VGA graphics is also part of the deal.

The battery can last up to an hour and a half and takes four hours to recharge. A quick charge unit can be bought separately for £127.

The N33 SX Notebook should be available by the end of August. ■

AN *EXPRESS* EXCLUSIVE

Win with your Amiga

New Computer Express, in conjunction with the Amiga Centre Scotland, is offering you the chance to enter 1991's Amiga Animation festival.

According to the centre, it is looking for: "The funniest, the most colourful, the weirdest, and most wonderful entries to this year's competition. Top quality prizes are up for grabs, not to mention a step on the path to fame and fortune".

The competition coincides with the internationally renowned Edinburgh Festival. Winning entries will be exhibited at the Amiga Centre between 21 and 28 August as part of a wider, non-computer related animation festival.

If you have an Amiga, then you can enter. Simply create a sequence of moving frames, and send it in on either floppy disk or PAL-compatible video tape. All entries have to be accompanied by an official entry form – such as the one you see below – and must be received at the Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh, EH1 3RN, Scotland, by 31 July.

Last year's winner, Eugene Messina walked off with an Amiga 3000 after sweeping the board with his effort, entitled, *Main Video*. This featured an imaginative camera work over mundane articles such as a Coca Cola can, alarm clock, and framed photograph. The Amiga created camera swooped over a desk which itself sat in a darkened room. Lighting effects were achieved by a plot twist which sees a standard lamp suffering from a bad connection. Eugene used an A500 running *Turbo Silver* software, and recorded in five second section on to standard VHS video tape.

So, if you think that you can do better, you should fill in the card and send it off. ■

• The winner of last year's Amiga Animation Competition, Eugene Messina, walked off with an Amiga 3000. This is one frame from his Main Video computer produced film. Do you think you could do better? Well put your floppy where your mouth is. Send in your entry now.

TOMORROW'S CUTTING EDGE

More far-out facts from a future that's getting increasingly closer...

Stock Invaders

Consoles are growing up. The giant Japanese manufacturers, Sega, for example, is not content to let its 16-bit Mega Drive (or Genesis as it is known in Japan and the States) just sit on desks and play games. It has extended the machine to access live financial news from the Tokyo stock exchange.

Using a network adaptor – basically a specially customised modem – yuppie gamers can download up to 20 pages of Nikkei Dow index's finest stock information at a time.

This radical move takes Sega's 16-bit, 68000 chip-based system out of the game console category with a new, almost Prestel-like approach.

Tokyo-based Sega has signed an agreement with the Daiwa Securities finance house which enables the console maker to begin supplying the on-line service in Japan from this week. No UK details have as yet been announced. For the future, both companies are considering adding sports information to the system, notably baseball scores and racing results.

The Mega Drive supplied with the network adaptor comes in at 40,000 yen out East. At the current Yen-Sterling exchange rate This works out to around £170.

Sega's arch-rival, Nintendo, has several peripherals already available. These include a disk drive, a 'disk-fax', and although it has not been announced as yet, a keyboard is thought to be in development by the company.

The successful 8-bit Nintendo Entertainment System (NES) is fitted with a 48-pin expansion port which would make a modem connection feasible. With the disk drive fitted, this would make downloading data from such networks a working probability. ■

• The Sega Mega Drive: now you can play more than just games on it. There's millions of Yen at stake on the Tokyo exchange.

For more news on Sega's plans for the future of its machines, turn to pages 4 and 5.

• If a Canadian company's plans for the extention of satellite-linked computing is a success. the networking for the person in the street need not be a case of frayed wires and headaches

Networks in Orbit

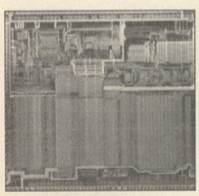
Fast, cheap and extremely cheerful, that's the news from Canada this week. Satellite networking of computers moves on a pace with the opening of a link between Canada's Unitel Communications and the US.

The ramifications for real-time interaction of computers across the globe via satellite are huge. One of the most important would be a reduction in the cost of transmitting data. This could eventually mean your own home micro could network with another on a different continent without recourse to long-distance, squawking telephone lines, allowing shared use of data, voice and fax facilities.

But for the time being this practice is limited to those on corporate-scale budgets. The Unitel deal hooks its own private virtual network up to MCI Communications' Vnet service and establishes Unitel's third such link with a US carrier.

European virtual network links, developed in conjunction with satellite carrier Teleglobe Canada, are also imminent, but are not yet in operation. ■

The need for speed



• How fast do we really need to go? Some say that 50MHz is zippy enough, others are looking at supercomputers in silicon..

Chips keep on getting faster and faster, and this week brings news of blistering speed from the land of the rising sun.

Matsushita Electric has developed a 64-bit microprocessor that will be a key factor in its development of a parallel processing system capable of steaming up to 20 gigaflops – more than 4,000 times faster than an office PC. Compare that to the story we had carried on this page last week about Intel's record-breaking $20million 8.6 Gflop monster and things start to get seriously scary.

The new chip, called the Ohmega, is based on RISC (reduced instruction set computing) technology, runs at 40MHz and can perform 80 million floating point operations per second (flops). It has a surface area of just 14.7 x 15.3mm. Such a turn of speed at such a size is possible thanks to 0.8-micron CMOS (complementary metal oxide semiconductor) technology in the chip architecture.

The company claims it can link multiple Ohmega processors and connect them to its Adernet parallel processing system for 20-Gflop performance. In the meantime, watch this space. But don't blink or you'll miss it. ■

Dicing with data - the optical revolution

A rewritable optical disk with a data storage capacity triple that of current media is being developed by Japanese electronics giant Hitachi.

The device allows a whopping 1.5 gigabytes (Gb) of data to be stored on to a five-inch disk. The fact that the disk can be written to and erased indefinitely is a major advance in data storage technology.

GREEN BEAM

Currently optical disks are written to using an infra-red semiconductor laser. However, Hitachi's new device emits a green beam only half the wavelength of infra-red so more detailed lines can be drawn on to the disk.

Of course, the technique requires a special kind of disk and a new twin-layer system is under development. The disk is made from yttrium, vanadium and oxygen, then a layer of tellurium, iron and cobalt is applied and finally a platinum and cobalt compound is added providing the second layer.

This elemental sandwich is a far cry from the simple CD of today and Hitachi admits it is going to take some time to develop properly before such data-hungry disks hit the market.

And if Hitachi's 1.5Gb disk isn't quite enough, hot off the press comes news of a 14Gb ETOM disk.

American company Optex has announced an improvement in its Electron Trapping Optical Memory (ETOM) technology, enabling the firm to make a giga guzzler that can be read at a rate of 120 megabytes each second.

GENERAL ELECTRONS

ETOM uses the movement of electrons between memory states to store data, unlike conventional disks which use tiny bumps in a foil substrate. Also, by writing to disk with a blue light and reading with infra-red, the disk is never heated and so can carry even more data.

But wait, there's more – the technology is capable of storing amplitude symbols for 0, 1, 2 and 3 instead of the usual on or off states. The 'quarternary' coding means a further four-fold increase of storage capacity in the same space.

CAPACITY CROWDED

And just when you thought it was stuffed to the gills, by shortening the infra-red wavelength a further two-fold capacity can be achieved.

All this may sound a trifle expensive, but Optex predicts a less complex and consequently cheaper read/write head can be used. ■

• Optical illusion or fact? New read/writeable optical disks can hold up to three times more data than conventional media.

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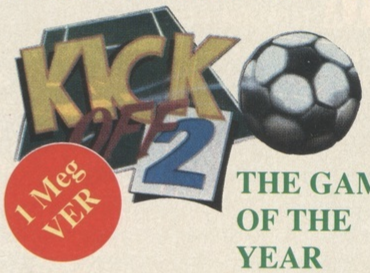

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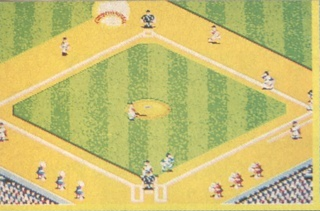

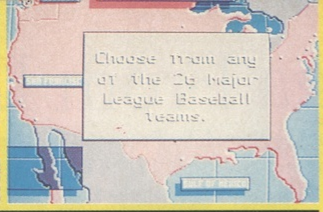

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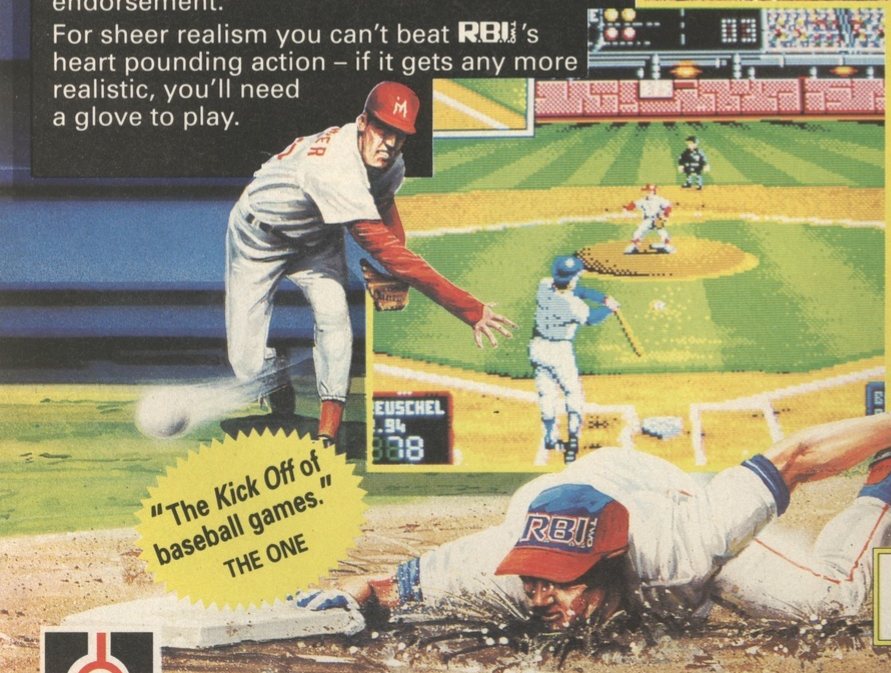

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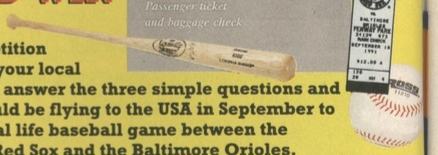

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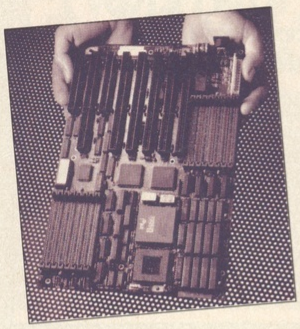
Amiga & Atari ST Screenshots

WHAT'S NEW

More essential no frills news of all the latest hardware and software

Motherboard and baby

PRODUCT: Tiny 486 motherboard
NAME: Genoa's Baby AT Format 486
COMPATIBILITY: PC



• Smaller than the average board. Genoa's new range of Baby AT motherboards could pave the way for small footprint 486 computers.

For systems builders who need power but are a bit stuck for space, Genoa Systems has launched what it claims are the world's smallest 486 motherboards.

The two boards have been designed in what the company calls 'Baby AT' format. Each is only 8.6 inches by 13 inches which is considerably smaller than normal 486 boards.

Available in 25MHz and 33MHz versions the new Baby AT boards feature six 16-bit, AT-type slots and two 8-bit PC-type slots. Each can hold up to 64Mb of on-board RAM which automatically resizes when you upgrade so there is no need for manual switching.

One of the most obvious advantages in in the construction of small footprint 486 computers.

Price: MBA42125, 486-25MHz, 64KCache £1,059
MBA42133,486-33MHz 64K Cache £1,159
MBA48125, 486-25MHz 256K Cache £1,159
MBA48133 486-33MHz 256K Cache £1,279
Availability: Now
Target Users: System builders working with very tight space constraints
Contact: Genoa Systems: 0932 33737
Perceived competition: None

Notable notebook

PRODUCT: 386 notebook computer
NAME: Akhter LCN 386-20
COMPATIBILITY: PC

Although Akhter is among the top ten information technology manufacturers in the UK, its name is hardly on everybody's lips. This is because it mostly sells into the education and military markets. However, the company aims to change all this with the launch of its competitively-priced 386 notebook computer, the LCN 386-20.

With an A4 footprint and weighing only 7lbs, the LCN comes with a 20Mb hard disk, a 1.44Mb floppy drive, Windows 3.0, a serial mouse and a carry bag. It has a high definition LCD screen which supports VGA graphics with a resolution of 640x480 pixels.

The company is confident that the LCN is the product that will allow it to break into the mass market. Marketing director Allan Tillbrook reckons, "The LCN is the best price/performance notebook product currently on the market. It packs all the features you would expect from a desktop 386 personal computer into a machine that fits into a suitcase."

So perhaps Akhter will be a household, or at least office-hold, name by this time next year.

Price: £1699
Availability: Now
Target Users: Small to medium businesses
Contact: Akhter: 0297 443521
Perceived competition: Cheap notebook PCs imported from the Far East, Samsung, Hyundai

Jazzy colour at a low cost

PRODUCT: Super VGA colour monitor
NAME: SV1481/82
COMPATIBILITY: PC

• The psychedelic splendour of the SV1481/2 Super VGA colour monitor is within financial reach of even small businesses.

The price difference between monochrome and colour monitors is narrowing all the time, so that many small businesses can now seriously consider buying jazzy monitors such as the Super VGA colour SV1481/82 from Southern Peripherals.

At just £240, it can support all VGA configurations modes up to 1024x786 pixels with 256 colours, with a 14 inch screen which appears almost flat. Weighing 12.5kg it comes with a tilt and swivel stand.

While, as the company admits, it would never win any prizes for amazing resolution images, it does provide, "Basic, good, last-three-years quality."

Price: £240
Availability: Now
Target Users: According to the company, anyone who wants a "dirt cheap" colour monitor.
Contact: Southern Peripherals: 0256 819221
Perceived Competition: Low cost Taiwanese imports, ADI, Samsung.

Tidy disk

PRODUCT: Disk holder
NAME: Fellowes Multimedia Storage Tray
COMPATIBILITY: Across the board

If you are the sort of person with mountains of various sized disks toppling from your desk the Fellowes Multimedia storage tray could be what you need.

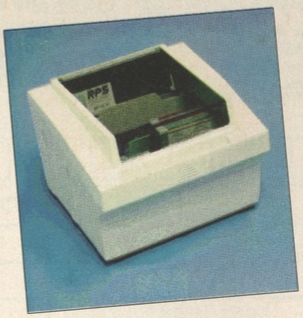
It is a cheap disk holder with a difference; it can be simply adapted to hold 5.25-inch disks, 3.5-inch disks, CD-ROM disks and mini data cartridges or any combinations of the four you need.

Constructed of environmentally friendly polypropylene, the trays come supplied with four specially designed dividers so that you can organise your disks as you want.

The trays have also been designed so that they can be stacked on top of each other, to further save desk space.

As the company points out, at £6.95 the trays are competitive as a 3.5-inch disk holder alone, but it also offers much more adaptability.

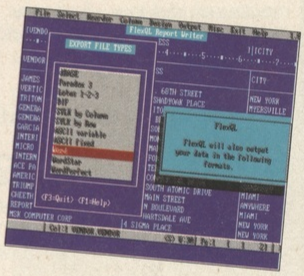
Price: £6.95
Availability: Now
Target Users: Everyone with desk space problems
Contact: Fellowes Manufacturing (UK): 0302 885331
Perceived Competition: All the cheap plastic disk holders from Taiwan



• You can see all your disks of various shapes and sizes neatly arranged inside the Fellowes Multimedia Storage Tray.

Reports can be made simple

PRODUCT: Relational report writer
NAME: FlexQL
COMPATIBILITY: PC



• DataFlex reckons that its relational report writer is the only system around to offer such a wide range of functions to create stunning reports and presentation documents.

Do you need to compile a report in double quick time? All the info locked away in various computers and mainframes? Then FlexQL could be the answer.

It is a simple to use relational report writer which can collate information from various sources and programs into a professional-looking document that requires no programming skills. Everything is achieved using action bars, pull down menus and mouse controls.

It can produce everything from simple listings to containing complex reports containing calculated columns, multiple subtitles and text. Information can be imported from DataFlex, Lotus, dBase, Paradox, Clipper, Foxbase, DIF, SYLK and ASCII files.

The resulting masterpieces can be exported on to WordStar, WordPerfect and Microsoft Word.

Price: Starting at £295 for a single user version
Availability: Now
Target Users: Business users who need access to various sources and mainframes
Contact: DataFlex: 071-729 4460
Perceived Competition: The company reckons that there's no other system around that offers the same range of features as FlexQ. ■

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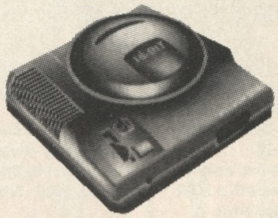

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EXPRESS MAIL

Welcome to Britain's liveliest letters pages. This week we ask:

- Is Express becoming New Commodore Express?(Answer - NO!)
- Where oh where is the Archie column? (Answer - Search me!)
- Are businessmen the real software pirates? (Answer - maybe)
- Why are there no TV computer shows (Answer - good question)
- What happened to the naked dolphins? (Answer - pervert!)

NACE one?

I think it's about time you people came clean and renamed your magazine New Amiga Computer Express. Does the CBM company pay your mag for drooling over the Amiga every week? I think it is about time you started a weekly Amiga magazine so that us 8 bit and other computer owners can get a look in in the pages of Express. I only now buy your magazine because there's no other weekly. Come back Pop all is forgiven.

I suppose that if you print this letter at all your reply will be the usual type of sarcastic comment on this subject that we out here in customer land have come to expect

Septimus Basildon Essex

YEP YOU guessed it - next letter...

I wish to protest at the number of articles on the Apple Macintosh. Don't you realise there are only 2 Macs in the whole of Britain?

SERIOUSLY THOUGH Septimus, if it's possible to be serious with a name like that, if you examined NCE carefully you'd notice there are more news and reviews of PC products than any other machine including the Amiga. The reason's simple - there's more happening on that format.

We try and cover everything for all machines but at present, the Amiga is doing a storm - hence the coverage. Also, out of the 19 writers and contributors working on NCE, only 5 own Amigas, so it's not because we're fanatics or CBM lackeys okay? Stay tuned

Pure bias

Can you enlighten us as to what new Amiga developments we are going to see in the coming weeks of New Commodore Express?

I await your answer with baited breath.

Kevin McCaughey Liverpool

WELL KEVIN there's a whole bunch of Amiga developments coming your way over the next few months. They'll be on the front cover, in the news pages and in Jason's column. But you'll need to keep an eye out because they'll be between masses of stories on other machines. Sorry, but do a head count will you? - it's your bias that's showing.

Wireheads

I expect I am one of many Amiga owners who will write to you regarding the article entitled 'The Halcyon Days of Amiga Games'. (you're the only one actually - H F-W) **This is one of the biggest loads of trash I have read in my entire life. Stuart Campbell seems to think that the Amiga will become a wirehead's machine in only five years of existence. He says the Amiga and its siblings will follow the same path as the 8-bits.**

The 16-bits took five or six years to win ove r the 8-bits. This means the one year old consoles will overtake the 16-bits in 1996!

Simon Richards Twickenham

BUT THE Amiga's already been around five years. I thought Stuart's piece was alright actually. Claiming the Amiga won't one day become a wirehead's machine is like burying your head in the sand. Okay, so maybe it won't be until 1996 - but it stands to reason it'll be out of date sooner than later. Come to think of it, the Amiga's already out of date anyway. I know this because I'm at this moment typing this reply on the office NeXT. And before you write in saying the Amiga's better than a NeXT read Amiga-owner Keith Pomfret's review on page 49.

RIP Arc

As one of the minority Archimedes owners I was deeply distressed not to find an Archimedes column in issue 135 of NCE. Surely the column hasn't been dropped? When you consider that half of Express is printed on paper not even up to the standard of the paper used in council toilets, surely NCE can afford an Arc column? An explanation to this worried minority would be appreciated. One other thing, just how big does a certain computer's software base have to be before it is considered not so small anymore? Any response welcome.

S R Mansfield Margate Kent

SORRY but the powers that be have decided it's curtains for the Archimedes column. But that's not to say coverage of the Arc is over - check out one of the lead news stories this week. But as for the regular column - well, like the machine, it never really took off did it? So just how big does a software base have to be? Well...err.. bigger than the Arc's that's what.

Pure cynic

Your magazine sucks. First you give us a Arc column then, when we're hooked, you drop it. You're all just totally cynical.

H R Hardy Chichester

IT NEVER ceases to amaze me how deeply serious some people get about their machines- so much so I was thinking of passing this over to our resident Dr. Clare. But let me persoanlly reassure you - we're just dropping the column - the news material it offered will be picked up in just as much detail, if not more, in our news pages.

TV PC show

I write to tell you of my disgust of the television industry at present. Why don't they realise that it's time for a regular slot for a computer program? In the early eighties there were a number of short lived shows that concentrated on the 8-bits but there has been nothing since. It's not as though there's a lack of interest in the subject. In any newsagents you'll find over forty regular magazines dedicated to nothing else.

It is estimated that there are enough machines in this country for every household to have one installed. It would be nice to see a program devoted to gamnes and hardware equally and to give advice to all formats, presented by someone who knows what they're talking about (i.e. not Tim Smith) What do other readers think?

Simon Richards Twickenham

WELL I KNOW what I think Simon and this time I'm in full agreement with you. So if there's anybody from the BBC reading please do the following right now. Walk up to Michael Checkland's office on the top floor, and push the following memo under his door :-

Yo Boss Michael,

I for one am completely appalled by the crass amateurism which typified the pathetic attempts made by the BBC to broadcast programmes purporting to be of interest to computer users. The two, so-called, series, namely Micro Live and Electric Avenue, were absolute bilge.

You should get your act together now and stop pushing snooker as the most cultural pursuit ever devised in the history of advanced armchair viewing. Resign now or put on a decent computer programme.

Yours sincerely,

(sign a colleague's name here)

There, that got that out of my system and for those two letters in one ish Simon, I'm sending you a fiver towards the postage.

Yuppie crime

ONE OF HAYDN'S WINNERS £5

I am a computing-degree student, and I worl part time in a computer shop on Tottenham Court Road.

I agree that software piracy, admittedly carried out mainly by adolescent male computer users, is damaging to the industry as a whole, but I feel that the real damage is done not by these people, but by the new generation of yuppie-pirates.

I am alarmed by the number of

ON THE COUCH

This week's handy psycho-analytical tip goes out to Mark Sangster of Retford Notts. All he did to get his deepest desires in print was to write in with the name of his machine, his favourite software, and the machine he'd most like to own.

Our resident psychiatrist, Dr Clare Anthony, then placed him on her leather couch here in Express's mahogany walled New York office overlooking Central Park and probed the inner reaches of his psyche. All your unconscious has to do for an all expenses paid trip is to write in for a free diagnosis to : Leather Couch Clare, New Computer Express, 30 Monmouth St, Bath BA1 2BW.

So take it away Mark! and we hope you enjoy the flight

● MACHINE OWNED:
Amiga
● FAVOURITE SOFTWARE:
Tetris
● DESIRED MACHINE:
IBM 3270 mainframe

Mmmm..I was wondering when I'd receive a letter like this. Mark, it's clear the problem is your relationship with your father. How can I be so sure? Well let's first position the Amiga within the current neuro-pathological framework shall we? As we all know, the machine is a significant object of desire. And as with all such objects, your ego is constantly attempting to repress the unconscious wish to bond with that object on an extremely intimate level. Yes, Mark, I'm afraid we're talking sublimated digital bestiality here. And what's more your unconscious knows your father has found you out!
It's so easy to detect! Firstly, you are using your addiction toTetris as a substitute for prolonged and meaningful intercourse with your Amiga. Secondly, it's clear that the IBM mainframe represents your unconscious need for a stern father figure to punish you for your habitual joystick waggling.
DIAGNOSIS: Throw away Tetris immediately and buy a C++ compiler. You will shortly become adept at mainframe programming, become a systems analyst, earn millions and your father will finally forgive you.

"respectable" business people that come into the business department where I work, telling me about the copies they have. Yesterday, a customer came in, and was looking at DTP programs for the ST and PC. When I asked him if he needed any help, he replied that he was just looking around. He then asked me if I could order him a manual for CALAMUS on the ST and COREL DRAW and 3B2 2.42 on the PC. I looked a little puzzled and asked him why. "I've got pirate copies of them!" he said proudly, slipping his spectacles back into his top pocket. I told him that I couldn't help him, and he went back to his chauffeur-driven Jaguar.
I believe people like him, and he is not an exception, do more damage to the industry than teenagers copying games, for those such as CALAMUS and 3B2 will spend thousands on research and development for these programs, and then can only hope to sell a few thousand copies and therefore rely on these sales to stay alive. From a moral point of view, the rich businessman's theft is even more disgusting than the adolescent pirate's because he can actually afford to buy the program, and he is going to use the program he has stolen to make money for his business.
Whereas copiers of entertainment software can (dubiously) argue that if they didn't have a pirated copy, they wouldn't have the program at all, business users cannot do this, because in many cases, the programs they use are essential to their business and they could not operate without them.

Marcus D.East Edmonton London

UNFORTUNATELY I THINK it's getting to the point where people don't expect to pay for software full stop. Maybe the reason there's so much 'professional' copying is because so much PC and Mac software in particular is not copy-protected. Human nature being what it is, the software just gets copied willy nilly.

Copy cats

ONE OF HAYDN'S £5 WINNERS

Pirates may not rip-off CDs here, but apparently it's big business on the continent. As well as tape and disk copying, cartridge copying is the latest game.
One importer a couple of months back reckoned 2/5 cartridges were pirates most coming from Hong Kong where they cost $3-$4, compared to $10-$20 for the original.
I agree with your views on piracy and because possession of pirated software is an offence, theoretically you can be arrested for an archive containing some cracked game, eg Elite, Robotron etc.
Why can't Spartacus, IPL, Dark Shadow, Phoenix etc do something worthwhile like write a better game than hacking everyone elses?

Giles Metcalfe via Aspects

YEP IT SEEMS that cartridge copying has been doing the rounds for a while now. Express first heard of Sega devices here two years ago but in Japan you can buy them quite legally. and to prove it here's an ad out of a current Japanese magazine *Compu-game Monthly*
I still reckon CD-only releases are the

• You may not undertand a word of it but this is an ad for a Megadrive cartridge copier on sale in a leading Japanese magazine

medium term answer though because the duplication costs would be so massive an outlay it would immediately get rid of all the bedroom cowboys. Though no doubt in the long term someone would find a way.

Ad nauseum

ONE OF HAYDN'S £5 WINNERS

Here's a list of my top ten hates applicable to your ads section. At number one by a long chalk, and they all know who I mean :-
1 buyers who say they will but won't (yes I'll have it, the cheques on it's way, Ha Ha)
2 prices excluding VAT
3 readvertised due to time wasters
4 add more money for post and packing
5 add even more money if you want it this month
6 only xxp each (orders over 1000 only)
7 portable NeXT for sale
8 includes games pack worth several hundred pounds
9 upside down ads
10 Out now

Alan H Foster Southampton

YES IT'S PROBABLY about time we restarted those top ten lists so to everyone out there, here's an advert for one of the best possible deals in town - **"I AM OFFERING £5 FOR THE BEST TOP TEN LISTS I RECEIVE EACH WEEK - THEY CAN BE ON ANY SUBJECT YOU WISH AS LONG AS IT HAS SOMETHING TO DO WITH COMPUTERS AND IS NOT JUST A LIST OF YOUR FAVOURITE GAMES."** Write to the usual address and mark the envelope "Publish this list or I'll kill you"

New format

I thought I'd try getting in touch with you this way for a change. I'd like to start by saying that your new formatting of the letters page is the most barefacedly cheeky way of using fewer letters to fill the same space. We readers will not be conned!
Just think what else you could use all those half inch gaps for

David Tonge via Aspects

OOH ERR...steady on a moment. We introduced the new format for two reasons. Firstly, so you can use the 'creative white space' as an area to write copious notes for when you send in your replies. Or, alternatively, so you can cut them all out, stick them together and save yourself the cost of toilet paper. How's that for green consciousness?

Pervert

Give me more naked dolphins. I can take it.

John Spears Cardiff

I'M SORRY but I can't. The mere thought of these gorgeous, uninhibited sub-aquatic lovelies drives me wild. I also think I should protect the more impressionable readers out there. Anyhow, the Editor prefers Killer Whales.

Write Now

Write and tell Haydn Fitz-Williams what you think! Reach him at: *Express Mail, 30 Monmouth Street, Bath BA1 2BW.* Sorry, no personal replies, even with an SAE and remember, only SOME letters win a fiver!

On-line mail

Own a modem? Then squirt us a letter. *Express* has its own area on Aspects bulletin board (061 792 0260) where you can leave mail and upload/ download files. We also have our own conference on CIX. Why not give this on-line service a ring on 081-390 1244 and talk to us direct!
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APD 8. Music & Samples 1 (MA)
APD 9. Amos Big Demo v.4 (DFM)
APD 10. Samples 2 (MG)
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APD 12. Samples 4 (MG)
APD 13. Samples 5 (MG)
APD 14. IFF Pictures 1 (AFT)
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APD 17. Instruments ST.01 (MG)
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APD 82. Jukebox Demo B (Dem)
APD 83. Amos Paint (Ut)
APD 84. Luke Miller's (MA)
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- **SAS/Lattice C Compiler upgrade from HiSoft**
- **Confused by C? What you need is an interpreter**
- **KCS unveils a powerful upgrade to its PC emulator**

LATTICE UPGRADED

HiSoft has a couple of very nice products lined up for release later this year. The company already has what must be the most complete range of Amiga programming utilities on the market, but that range is to be extended still further with the release of both new and improved products.

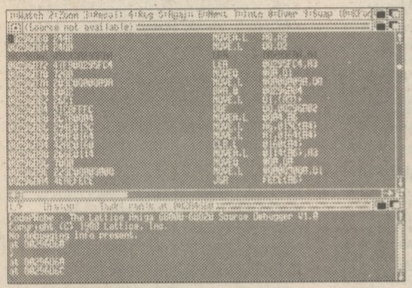
For C programmers, HiSoft has not one, but two new products on offer. The first is the latest release (version 5.10) of the industry standard SAS/Lattice C compiler that is used by just about every Amiga C programmer worth their salt.

Although Lattice itself is no more, the SAS institute has taken on the responsibility of producing upgrades and supporting existing users.

Here's what it has to offer:

- IMPROVED WORKBENCH USEAGE – If the CLI reduces you to a cold sweat, then you'll love Lattice's new Workbench interface. You can now compile and link your code from a nice friendly *Intuition*-based frontend. As a result, there's no more complicated command line parameters to enter, just set everything up from a requester, select COMPILE and you're away.
- PERFORMANCE IMPROVEMENTS – No detailed figures were available, but HiSoft assures me that Lattice C version 5.10 is jolly quick. Then again, it could hardly be slower than previous releases could it?
- DEFAULT OPTIONS – Why type in the same command line parameters over and over again when you could simply tell the compiler once how you want it to work? Well now you can. Version 5.10 allows you to set up a compiler configuration file that contains all the command line arguments you need.
- C++ SUPPORT – For the poseurs among you, the compiler now supports C++ style line comments. These can be mixed with normal C '/*' commands. Personally I wouldn't call this particularly impressive, but I'm assured it is.

☎ Contact HiSoft on 0525 718181.



• Fans of Kernigan & Ritchie's masterpiece of systems programming will be pleased to learn that HiSoft has launched an upgrade to the SAS/Lattice C compiler.

C FOR BEGINNERS

People used to languages like AmigaBASIC often find it frustrating that you have to compile your code each time you wish run it when working with languages like C and Modula 2. The answer is an interpreter, but these tend to be restricted almost entirely to BASIC.

However, all that is to change with HiSoft's new C Interpreter.

HiSoft claims that its new C interpreter system takes the tedium out of the C development process; just click on a menu item and your C program runs immediately. No compiling. No linking. No fuss.

As HiSoft itself says, there's no need for the usual compiler development cycle of edit, compile, link, run, crash (that's the one I'm most used to!), load, edit, compile etc...

Not only is HiSoft's C interpreter great for beginners, but seasoned C programmers will also find the ultra fast development environment a great relief. Obviously it won't produce stand-alone programs like a conventional compiler; instead it provides a quick and easy way of producing working code.

If you do need to produce stand-alone applications, then all you need to do is to run your source code through a 'real' compiler and it should compile and run without problems (not including logic errors, of course).

FLICKER FREE AND CHEAP

You probably already know that MicroWay has dropped the price of its Flicker Fixer card from £325 to just £125. The company claims the drop comes as a result of increased sales, but I'm not convinced.

Perhaps it has something to do with the fact that both Commodore and ICD have launched much cheaper units? MicroWay has been enjoying its monopoly for far too long, so it only serves to demonstrate how good a bit of competition is for us users.

So, whether it's the economics of demand or something else that dictated the previous price, I don't know. But what surprised me is how easily MicroWay chopped over 60 per cent off the price. If they had reduced the price to say £250 or even £200, I could understand – but £125? It makes you wonder, doesn't it?

In any case, the Flicker Fixer card has suddenly become a very attractive proposition to those of us that enjoy

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☎ If you too have been tempted, then give MicroWay a call on 081-541 5466.

KCS UPGRADED (AGAIN)

Bitcon Devices has released yet another software upgrade for its impressive little A500 PC emulator card, the KCS Power PC Board.

Version 2.75 of the emulation software supports the following changes over version 2.0:

● SERIAL PORT – The Serial port now supports 19,200 Baud. This has been successfully tested with the PC program *Telix 3.15* with ZModem download.

● SCREEN UPDATE – This was fast enough as it was (especially when you compare it to Silica's snail paced ATonce), but KCS has speeded it up still further. The new software now updates the screen 10 times faster than the original version of the software.

● FLICKER FIXER – In an attempt to reduce eye strain in interlace mode, the card now has an 'anti-flicker' switch built in that attempts to reduce flicker through software. I'm not sure how this actually works, but KCS claims it reduces flicker substantially.

● DISK SUPPORT – You can now directly read all those copy protected PC disks. This allows you to run substantially more software than was previously the case. Just think, you can now run *AutoRoute* under the KCS card!

● HARD DISK SUPPORT – KCS has extended the number of hard drives it can support to include the CBM A590, the Golem HB3000, the GVP Impact Series 2 and the Supradrive 500XP.

● BITS AND BOBS – There's a handy little RAM disk program that gives an extra 196K above the usual 704K in MSDOS (that's a total of 900K for the thickies among you). KCS has also written its own MOUSE.COM driver which is a lot better than the old one.

Jason Holborn

ARE YOU AN ICD NOVIA FASHION VICTIM?

Isn't it strange how everyone has been singing the praises of ICD's new Novia 20i (is it fuel injected?) internal hard disk kit for the Amiga 500? OK, there's no doubt that it's an impressive piece of kit, but I have a couple of things to say.

First, what's the point in having an internal hard disk in the first place? It's great for the 2000, but do A500 owners really need one? Sure, it keeps everything nice and tidy, but what price tidiness?

With Amiga hard drives being sold for around £250 these days, it seems excessive to fork out £650 for something you can't even see once it's plugged in!

Personally, I'd rather put up with a bit of extra spaghetti hanging off the back of my machine!

ST

- **Are we being fobbed off with below par games?**
- **ST poised to dominate the International Music Fair**
- **Thalamus blasts into the ST market with *Armalyte***

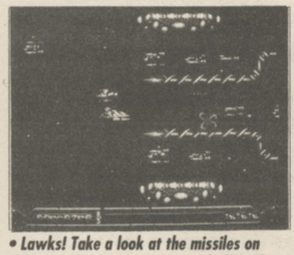
ARMALYTE, STREET LIGHT, NIGHT SIGHT

Nope, not U2 entering the ST arena, but Thalamus. This software house has been producing quality games on certain lesser computers for years and it has now decided to tackle the ST market.

Its first release will be *Armalyte – The Final Run*, a shoot-'em-up. In the game, you are the last of the Aalans, the final defence against the marauding efforts of the Armalyte nation. Your mission is to destroy the Aalan governors on four satellite planets and the home planet of the nation.

Expect some frenzied gameplay and a blast of power-ups; Thalamus doesn't produce wimpy shooting games.

The release date is pencilled in for the end of this month, price: £25.99.



• Lawks! Take a look at the missiles on that. Armalyte's got more punch than Chris Eubanks, so dig out your best joystick.

THE STATE OF THE GAME

There can be little doubt that there are a lot of second rate games on the market for the ST. You only have to thumb through the pages of *ST Format* to see a gaggle of dodgy games which have been pushed out of the software houses doors on a wing and a prayer.

Yet despite the low scores they receive in the magazine, these same games end up hogging the top of the charts for months. Why is this?

More often than not, games are sold on the back of a license; a film, a book or an event. The software houses know that this 'name' will go a long way to pushing you, the punter, to pull the

Continued on next page ➤

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box off the shelf and examine the screen shots on the back.

Yet often, these licenses are second rate formula productions with little in the way of gameplay and less in terms of lasting interest. This may seem perverse but worse is to come.

When the software houses *do* get it right and knock up a first rate game, it usually hovers around the top five in the chart and then disappears to a life of ignominy in the bargain bucket end of the chart.

The only reason I can see for this sorry situation is that you, the customers, aren't prepared to spend more than two minutes reading the instructions. So long as it's just a single sheet of fold-out paper with a paragraph of help repeated in 32 different languages, you're happy. The fact that you'll just have to go out and buy another dross game next week doesn't stop you handing over £25.

So, if you find yourself bemoaning the state of games on the ST, you only have yourself to blame. If you keep on buying these second rate production line games, the software houses will keep on producing them.

The next time you're just about to plant your dosh in the shop keepers hands, count to 10 and think: what kind of reviews has this game received, what do my friends have to say about it and, most of all, is it a license?

MUSIQUE INTERNATIONALE

The ST dominates the MIDI music market as surely as the Sun dominates the news-stands. If you went to the MIDI Music fair at Novotel in May, then you'd have seen this first hand.

However, if you missed out, then there's another show around the corner which deserves your attention.

The International Music Show takes place at Olympia from July 10-14. However, the first two days are trade only, so unless you have a friend in the music industry, don't turn up until Friday.

The show combines electronic music making and more traditional methods. What's more, loads of celebs turn up to have a look around, so you might find yourself bumping into Danii Minogue at the concessions stand.

All the leading manufacturers of music-related hardware and software for the ST will be there, most sporting natty stands. The show is also traditionally the event at which a wealth of new products are launched.

What's more, various 'names' will be participating in demonstrations and performances. Admission is £6 per person, £3.50 for the under 14s.

☎ Contact Stanton Alexander PR for more information on 0533 559711.

16-BIT SHOW

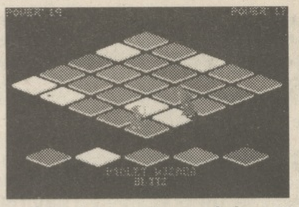
If music isn't your cup of tea, then check out the Fourth International 16-bit Computer Show taking place over the same weekend. Over 160 companies are expected to be taking stands at the show, including a large number of ST specialists. The show takes place at Novotel in Hammersmith.

☎ For more information call the organisers on 081 547 1183.

HI-TECH, LOW-COST, PD

So, how many of you have been playing Jeff Minter's shareware game *Llamatron* to death? Hoards of you, I hope. Well I have some good news. Nope, not another Yakky game, but certainly two worthy of your attention.

Spectral Sorcery is a belter of a game. The idea is to move a wizard around a grid of pads, converting them to your colour. You take it in turns against another player or the computer.



• **Spectral Sorcery *is one of those PD games that make you wonder why you bother with the full price ones.***

You can either stomp (turn the square you're on to your colour), ask for help, or cast a spell which turns a number of pads to your colour. It's well programmed and blimmin' addictive.

It's available from TRuST PD (disk number GAM71) at 18, The Park, Southowram, Halifax, HX3 9QY.

☎ Telephone 0422 341606.

Dark Wars is a dungeon master clone and it's shareware. The idea is to liberate yourself from a labyrinthine dungeon, overcoming loads of monster and puzzles.

You can use magic or brute force against these adversaries, but more often than not, the problem's simply finding your way around the dungeon.

Andy Hutchinson

Andy Hutchinson is the news editor on the UK's leading ST magazine, ST Format, *The latest issue is on the newsstands now.*

GETTING BACK TO THE BASICS OF COMPILING

GFA Data Media produces one of the best BASIC language compilers available for the ST. The package has just been updated to version 3.6 and includes some natty new functions.

The language has been designed to run with the entire Atari ST/STE/TT range. If you're lucky enough to own a TT, then you can use the extended graphic modes of this powerful work-station, as well as the additional I/O ports.

The language remains as structured as ever, combing the best elements of C and Pascal with the easily learnt syntax of BASIC. GFA-Basic includes some superb graphics handling commands and is a great way of side stepping assembly programming.

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If you want to learn C from scratch but have never been able to afford to purchase a C compiler then this amazing offer is for you! For just £19.95 we'll send you Mastering Amiga C plus – totally free of charge – the Charityware C Compiler NorthC and the Mastering Amiga C Programs Disk!

Containing 320 large-format pages Mastering Amiga C is applicable to all major releases of C and is specific to learning C on the Amiga. It assumes no prior knowledge of C and contains many easy to follow tutorials. Mastering Amiga C will be available in the first half of May – no cheques or credit cards will be cashed or debited until the book is dispatched. Order today to avoid delay!

Mastering AmigaDOS – Volumes 1 & 2

The acclaimed two volume set that covers versions 1.2, 1.3, 1.3.2 and 2 of AmigaDOS co-authored by *AS* Consultant Editor and industry guru Mark Smiddy along with Bruce Smith.

Vol. 1: A complete introductory tutorial on AmigaDOS. 368 pages for just £21.95 including a free Utilities Disk when ordered direct. Amiga Shopper said: "*...one of the most comprehensive and lucid books available on AmigaDOS*" – Cliff Ramshaw and Jeff Walker.

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PhotoStyler allows you to retouch, enhance and print 24-bit colour, gray-scale and black-and-white images.

Once compatibility checks have been made and any problems sorted out *PhotoStyler* will be available from Aldus for $795.

PROBLEMS, PROBLEMS

Intel is in a bit of a quandary over its 50-MHz 486. Production problems are expected to push back volume shipments until the end of the year.

Design problems include the unfortunate side effect of the newchip producing its own radio waves. Therefore, gaining official approval from the FCC (who, basically, can't abide radio waves polluting the American airspace) is expected to be difficult.

There is also news of two different chip specs. A three-chip implementation includes a 486 processor coupled with an additional cache controller and a RAM cache. All three chips would run at 50 MHz, but will be capable of operating at a lower clock speed when communicating with the rest of the computer. The integrated chip set will arrive on one chip.

MODERN MODERN

I have recently become intrigued by a new modem from Falcom PLC of London. The company has announced a new, BABT-approved, Hayes compatible, quad modem which, Falcom claims, provides more features and higher performance than any other machine in its price range.

Priced at £345 the Falcom FCM2400 includes both V42bis and MNP5data compression and V42 (LAPM) and MNP4 error correction. It supports both CCITT and Bell standards.

In addition, there is a plethora of secondary features such as auto-answer/dial and speed selection, remote configuration and dialback with password security, memory for up to 21 telephone numbers, four user configurations and nine command sequences.

The whole package appears to be very friendly, you even get a telephone cable, 9-24 pin adaptor, a quick start dual-media software manual and a plug! I'll be looking a little closer at this one so bear with me for a full report.

☎ Contact Falcom on 081-843 2277.

A TURN UP

Here's one for the archives. Apple recently accepted a bid from IBM to use its 160Mb 3.5-inch internal hard disk drive in its Macintosh IIci and IIfx computers.

This is Apple's first equipment purchase from IBM. Apple normally work hand-in-hand with Conner or Quantum in these matters. However IBM, it was thought, was able to match the specified specs best.

UPDATED SOUND CARD

The PC market, as far as sound boards are concerned, is split into three.

At the bottom is the Adlib, mid-range is the Sound Blaster and way up top is the Roland.

However, Brown-Wagh announced that its Sound Blaster is to undergo an upgrade that will challenge and exceed the Roland in many respects. Called the Sound Blaster PRO it will retail in the States for $299.95. As soon as I get a UK price I'll let you know.

Here's a few of the specs:

- Stereo ADCs 8-bit, sampling 4-44.1MHz
- Recording from Microphone, Stereo In-Line and CD-Audio
- Stereo digital/analog mixer can mix all of the sources with full fade-in/out control,pan, volume, mic mixing and

Continued on page 22 ➤

DTP SHAREWARE: THE FINAL ISTALLMENT

In this on-going series devoted to specialist Shareware this week sees the last in the series on DTP (sniff). So enjoy this installment as you would your last glass of Beaujolais.

First out of the hat is *Copyfit*. This utility will approximate how much space your copy will require when type set.

A companion to *Copyfit* is *Copyfit IT*, a similar program in which you must enter the height and average characters per inch for each typeface and it will then handle the variations in typefaces for heading lines.

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2 x Midi cables	£6.99
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Protar Hard Drives

★ NEW ★ NEW ★

We are now *official stockists* of the latest in high quality / low price ST hard disk drives from Protar. All Protar hard disk drives come with a full 12 month REPLACEMENT warranty (no lengthy repairs!!), a DMA through port, device number switching and *Protar hard disk drives are the only manufacturer with the ATARI COMPATIBILITY seal of approval.*

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All STE Ram Kits come with instructions and DO NOT require soldering in most machines.

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Due to high demand sales, we have now run very low on stocks of the ST software packs below. Therefore, please ring for availability before ordering. For contents of the ST software packs - see the listing of ST computer ranges on the opposite page or phone us for details.

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The amazing 32Mhz TT030 is now available in the following configurations :

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All of our printers come with a parallel cable to suit Atari ST, Amiga and all standard PC etc (other cables available at extra cost - ask for details). All printers carry a full 12 months warranty. We only sell genuine UK stock - we do not offer inferior "grey imports".

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ATARI STE PACKS

ALL ATARI ST PRICES INCLUDE VAT AND UK DELIVERY. ALL PRODUCTS CARRY A FULL 12 MONTH WARRANTY. PLEASE RING US BEFORE ORDERING TO CHECK STOCKS AND CURRENT PRICES.	512k	1mb	2mb	4mb
ATARI STE STANDARD PACK. consists of the computer with mouse, tv lead, manual and all connecting leads etc. The Standard Pack is supplied with NO software.	£269.00	£299.00	£329.00	£409.00
ATARI STE DISCOVERY 1. consists of the Standard Pack and STOS, First Basic, NeoChrome and 4 games (Carrier Command, Space Harrier, Outrun, Bomb Jack)	£279.00	£309.00	£339.00	£419.00
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ATARI STE EXTRA. consists of Standard Pack and Kuma word processor, database, spreadsheet & business graphics as well as First Basic, Hyper Paint, STAC Adventure game designer and Prince game.	£289.00	£319.00	£349.00	£429.00
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Phew! Quite a spec and quite a package. This could also be the card that finally makes it into Sierra's delayed multimedia CD-ROM package (that includes a CD-ROM, free games, sound card, etc) retailing at around $600-700.

☎ Contact Brown-Wagh on 0101 408 378 3838

ULTIMATE GAMING

A future blockbuster from Origin (if the company's track record is anything to go by) is *Ultima 7*, which should be out and about this Christmas.

The Ultima series is highly regarded by many as being one of best, if the *the* best, character role playing games on the market.

To fully appreciate *Ultima7*, however, you are going to need 2Mb of RAM and 15Mb of space on your hard disk! Someone find a brandy.

☎ Call Mindscape on 044-831 761.

Paul Rigby

SPECTRUM

- **128K lives! – Two new games that won't fit into 48K**
- **Play it again SAM: musical releases for the Coupé**
- **Infinite lives and other powers for Multiface owners**

128K SIZED FUTURE

Although the Speccy's come with a pulsating 128K worth of memory as standard for years now, there have been precious few games that have taken advantage of it.

And if they have made use of all that extra power throbbing under the bonnet, as it were, it's only been for relatively superficial things like hipper sounding music or no multi loading.

As desirable as these things are it's generally agreed that a lot more could be done with the extra memory on offer and the few 128K only releases to date like *Where Time Stood Still* and *Carrier Command* have certainly shown this to be the case and gained skip loads of praise into the bargain.

Well the good news for everyone with a bigger Speccy is the imminent arrival of two 128K specific games that look like utilising every single bit of the machine's rippling extra muscle.

Firstly,there's *Toki*, Ocean's new arcade conversion with a jungle based, platformy theme which apparently was a bit of squeeze to fit into 128K let alone poor old 48K!

It looks very good indeed with well drawn characters, five levels of jungle and some very nasty end of level nasties. Thankfully those nice people at Ocean aren't going to charge any more than they usually do for this memory intensive number and the asking price is the VAT adjusted standard £11.23.

The other 128K sized slice of action lurking on the horizon is *Rodland* from Storm (who were responsible for *SWIV*). This is the first cutesy, *Bubble Bobble*-type game we've been subject to for oh, at least a week , and needs the full 128K in order to accommodate no end of fluffy characters, ranging from baby seals to rabbits.

Rodland won't be out for a few months yet but will doubtless be worth the wait. I hope this is the start of a 128K renaissance. The 128K, Plus 2 and especially Plus 3 have rarely been tested to the best of their abilities and it will be interesting to see how far the above two games can stretch the Spec's spec. Watch this space.

ETHNIPOD HOT TIP

There's no need to type in that long listing featured a few issues ago. Instead simply type DEMIGOD into the high score table for infinite lives.

MULTI-EXTRAVAGANZA!

Here's a special treat for owners of Romantic Robot's excellent Multiface widget – a lovely long list of pokes.

For the uninitiated, unaware and just plain thick, a Multiface is a truly wonderful device that you plug into the back of your Speccy and use to stop programs dead in their tracks with the prod of its magic red button.

The Multiface tells the game or whatever to "hold it right there" (untechnical explanation) and allows you to examine the code, PEEK, POKE and generally mess around with it. That's as well as providing options to back up the program, which is invaluable for transferring games on to disk for Plus 3 owners, or print out a screen dump.

Multifaces vary in price from £29.95 to £39.95, depending on which Speccy you own and are a absolute snip at the price.

More details are available from Romantic Robot at 54 Deanscroft Ave, London NW9 8EN.

And for the wise people out there who've already invested in one, here's a bevy of Multiface pokes to smugly insert into the appropriate games (many of which have recently been reborn on the

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U575 CLI Utilities
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U550 Master Virus Killer
U589 X Copy-3 Copying Programs
U507 Workbench Multi Util Disk
U534 Digitech Utils
U501 Complete Boot Disk
U557 Q-Base/Visicalc
U586 N-Cad
U548 Giant Utils Disk
U578 Cruser Basic Compiler
U587 Assisins Graffix Utils
U606 D Copy
U571 TV Applications x2
U528 Video Applications x2
U602 Disk Immune System - Guards Against Virus
AU 602 Full Clip Art Collection x20 Disks Various AU 802

BUSINESS

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B206 Clerk Accounts
B209 Amibase - Amiga Database, Very Simple to use
B212 Electrocad Demo
B219 Wordwright Wordprocessor
B256 Journal - For your Accounts
B283 C-Light Ray Tracing
B230 Bank Master - For your Bank Accounts
B258 Wordprocessor
B295 Business Card - Make yours now
B248 Analyticalc Spreadsheet
B290 Visicalc Spreadsheet
B216 Wordwrite/Amigaspell
B220 Appointment Calendar
B271 House Hold Inventory
B241 Textplus
B280 Hyperbase
B297 Home Business Pack Vol. 1-8
B285 Pagesetter - Very Good Program x3 Disks, 1 Meg
B236 Rim Database - Quite Complex. 1 Meg for good results.

MUSIC

MD970 D-Mob Music 3
MD991 Tiffany - I Think We're Alone Now
MD996 Dance Mix Vol.1
MD982 Digital Concert 1-6
MD990 Blues Brothers
MD950 Limited Edition - Dance Mixes 1-3
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MD957 Sun Sounds of The Summer
MD997 Madonna - Hanky Panky
MD975 Groove Is In The Heart
MD978 C.D. on a disk
MD985 The Winkers Song - Ivor Bigun
MD964 Inner City - Multi Trax 1
MD966 Depeche Mode
MD987 Total Remix
MD995 Dirty Dancing
MD961 Banging Raves No.1
MD932 Music Maestro
MD929 Beatmaster 3
MD917 Technotronic Remixes
MD973 Jesus Loves Acid
MD910 A Journey Into Sound
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MD980 Crusaders Project Beat
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29622, 0 Lives
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35135, 0 Lives
● *New Zealand Story*
50000, 0 Immunity
● *Guerrilla War* (128K)
40872, 0 Lives
48010, 0 No enemy fire
● *Video Poker*
45547, 0 Cash
● *Empire*
34783, 0 – Flip, press F
40913, 0 + 40921,0 System jump
47244, 0 + 50320, 0 + 50334, 0 + 50340, 0 Gravity drive
For the above two select map position cursor at destination and press 0.
● *F1 Tornado*
60838, 201 Invincible

Your respect is due to Jon Rose for the first three, Alan Johns for supplying the next five and Mark Harris for the others. Thanks to each of you..

Robin Alway

PLAY IT AGAIN SAM COUPÉ

• Of all the computers in all the world...

Our friend and brother the SAM Coupé seems to be realising its music making potential at long last. With an impressive and decidedly kicking six channel stereo soundchip and MIDI port as standard it makes the Speccy, and most other machines come to that, look like the Jason Donovan of the computer world.

The good news for SAM musos is the release of three new musical products. To start with, there's a Sound Sampler package from Blue Alpha priced at £49.95. For this you get an interface, microphone, documentation and control software.

Next there's *Music Master*, due for release on SAMCo's Revelation label. This is an apparently 'useful, fun and educational' software package that drives the Sam's internal sound chip using the standard keyboard.

Finally, and possibly most impressively, is a MIDI Sequencer from Tim Humphries. SAMCo claims this will be a, "very powerful, professional quality package". It retails for £39.95 including MIDI cable.

It will be a good and glorious day when we see SAM on Top of the Pops!

C64

- **The Last Ninja returns in style, but is this the end?**
- **PD demos that show what the C64 can really do**
- **Whatever happened to the CD games revolution?**

TOO GOOD TO BE TRUE

The Last Ninja III was released on cartridge a couple of months ago, and as an afterthought System 3 has decided to release it on cassette and disk too. Obviously, the instant loading facility is not present, but the two prequels never suffered because of this.

The premise of the game goes something as follows. After having been dragged by a time warp to modern day New York in the previous game Ninja game, our hero Armakuni finds himself warped once again, this time to Tibet.

The game is set inside a Buddhist temple (in turn divided into five chambers – Earth, Wind, Fire,Water, and Void). Armakuni MUST defeat his mortal enemy, Kunitoki, less the Ninja be vanquished forever.

Each Chamber consists of a number of isometric screens. The Ninja can explore these screens as desired, unless an adversary challenges him – if the Ninja runs away from a battle it is considered dishonourable, and Bushido power will be deducted. Bushido power is vital for success and the completion of the game.

The status area includes a 'prayer wheel' which opens up to show the location of nearby objects, including weaponry such as swords, nunchackus, shurikens and staffs. There is also an assortment of objects which are used to solve the umpteen puzzles on each level.

The control method and fighting moves are fairly straightforward, and if you've played any other *Ninja* games it will be a doddle.

At the end of each level you encounter a Shogun, who must be defeated while you are holding a magic scroll – so you see, if certain objects aren't collected at the right time it will leave you up a certain creek without a rowing implement.

Having said that, puzzles are logical and well structured – it's only combat that becomes more difficult.

You may have guessed already that I simply adore this game. Gameplay is boosted by the need to gain Bushido

Continued on next page ➤

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power, so it isn't always best to run away from a mad warrior bearing a broken curtain rail!

The levels boast variety, imagination, indeed the whole game has been superbly designed and implemented – it could only happen on the C64.

Graphics are astounding, especially the end sequence; this is Robin Levy at his finest. Sound too is great, with seven superb tunes to enjoy, and there is no superlative to properly describe the *amazing* intro sequence.

Before you reach for the piggy bank, there is a catch; the version reviewed was the two disk set, and loading was a touch annoying, so cassette users might be better off buying the cartridge.

Still, it is a damn good game and a perfect end to a perfect trilogy. Or is it?

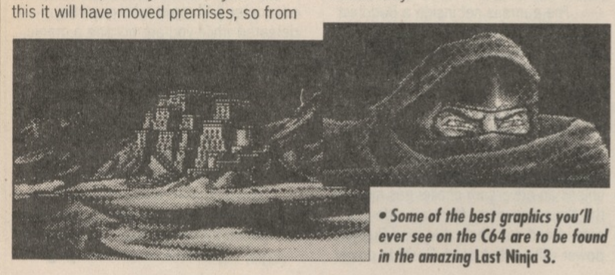
PERFECT PD

More disks have plopped on to the doormat this week, courtesy of Binary Zone PD. Oh, and by the time you read this it will have moved premises, so from now on contact Binary Zone at the new address: 34 Portland Road, Droitwich, Worcs, WR9 7QW.

After the technically excellent *Brutal 3* I was expecting big things from the Light group... and its new demo *My Oh My* delivers the goods. After the usual intro screen comes a ubiquitous FLI logo and some spinning spheres, accompanied by a great Jean-Michelle Jarre track. After this is a dazzling array of wibbly-wobbly sprites... how do they do it?

The next bit made me leap with excitement – FLI colour cycling, boasting literally hundreds of colours. Next comes a bog-standard scrolly message screen (come on, it wouldn't be a demo without one) and then a plethora of DYCP scrollers, guaranteed to induce serious headaches! After another scrolling interlude comes a staggering 3-D vector graphics part, where shapes transform and fly around the screen.

Who says the C64 is dead? A highly recommended demo, but sadly available on disk only.



• Some of the best graphics you'll ever see on the C64 are to be found in the amazing **Last Ninja 3.**

The next demo is absolutely colossal, boasting an incredible 14 separate parts (taking 1 and a half disk sides). Going under the name of *Ice Cream Castle* it features a guy approaching an ice-cream vendor. You then select one of 14 different toppings. Whichever you select loads in as a demo – very novel (especially as the guy is a brilliantly animated skinhead!).

I won't go into copious detail, but here are my favourite parts:

- Part one has an unbelievable FLI crest logo, which wibbles and floods, and would not look out of place on an Amiga.
- Part three has no less than 120 sprites rippling up the screen, into the borders, and beyond.
- Part five is a mini slideshow, featuring some of the best screens from *Defender of the Crown*.
- Part eight is simply amazing, mainly because of the vertical raster bars. It has to be seen to be believed.
- Part 10 again utilises and FLI crest logo, this time interlaced and rippled about with eye-popping results.
- Part 13 boasts some wild rasters, and features a great megamix of the best of the *Maniacs of Noise*.

Indeed, all of the demo parts have some great sonics togo along with the action.The demo scene seems to be buzzing with activity at the moment, and there are some reallyamazing productions out there.

Most demos only come on disk, unfortunately, but Binary Zone PD is planning a series of cassettes packed with top-class demos. So without further ado, send an SAE for more details.

And if anyone else knows of other PD libraries, drop me a line at *New Computer Express*, 30 Monmouth Street, Bath, Avon BA1 2BW. Who knows,weekly PD reviews might just spring into existence.

Andrew Roberts

THE CD REVOLUTION THAT NEVER HAPPENED

A couple of years ago Codemasters released its CD games selection (on all three 8-bit formats). I duly rushed out and purchased the said package, and it was an absolute steal; 30 games on compact disk, plus loading software and connecting cable, for only £19.99.

It started the industry talking, probably because the prospects were enormous. CD singles carrying the Spectrum, Amstrad, and C64 versions of a game could have been produced –imagine the potential. Loading was rapid and accurate and masses of games could be stored on just one disk.

However, everything seemed to fade into the past. Why did the software industry let this innovation disappear? Would CD games have made a difference? Was it a good way to combat piracy?

Would someone in the know like to drop me a line?

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Access

CPC

- **SPM Software's General Military Simulator**
- ***Gazza II*: the tape/disk version of console smash**
- **The secret file extensions in *Bonzo's Super Meddler***

GENERAL MILITARY SIM

For those of you fed up with zapping aliens from Zog, or taking out hordes of New York low-life with well-aimed Ninja kicks, SPM Software could well have the perfect alternative.

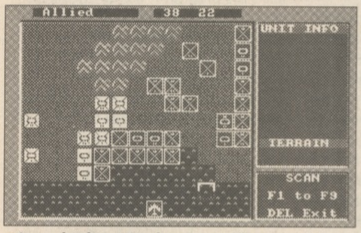
General Military Simulator is a kind of construction kit for conflicts. Although it comes with a variety of pre-programmed scenarios, the beauty of it is that you can also invent your own.

The game is based on SPM's established wargaming system, whereby two different map scales let you view both the campaign area as a whole and also zoom in to control your troop movements. The graphics are not earth-shattering, but they are functional. Remember, this is a thinking man's game, not an arcade blast.

Armour, infantry, airborne units, etc are represented by icons. Turns alternate between you and your opponent, and on your turn you send orders to all your various battle units. This can take a long time, since it involves lots of menus and choices.

The orders you can deliver fall into four categories:

- MOVE: You specify a direction and the unit moves as far as it can, depending on type, terrain and fatigue.
- ATTACK: This causes your unit to attack an adjacent enemy force. Taking the initiative is often useful.
- DIG IN: Your units will prepare for attack, selecting the most advantageous positions offered by the terrain.
- BUILD: This is how you develop all those air bases, bridges, etc vital for a successful push.



• ***General Military Simulator's graphics are crude but functional. You can design your own icons, too.***

The results of all the battles are worked out using "Effective Strength" calculations which take into account a units' strength, fatigue, morale, etc.

Playing any of the battles in *General Military Simulator* takes time, and so does developing your own. However, this isn't the sort of game you'd blast away at while you're waiting for the kettle to boil anyway.

For dedicated wargamers, and anyone who enjoys a bit of thought-provoking strategy, *GMS* will provide many, many hours of entertainment.

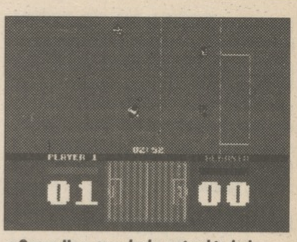
GAZZA II ON TAPE

Gazza II was a terrific game on the Amstrad cartridge. I mean, there wasn't what you'd call a lot of gameplay – no fouls, no penalties, no four-eyed refs – but what there was was simply oodles of fast, frenetic, footie fun. Quite simply, I don't think I've ever played a more enjoyable footie sim.

Anyway, the long-awaited tape/disk version is now finished, and I've been glued to the monitor screen for the best part of a day playing it.

The bad news is that the graphics are not as good as those on the console version. The pitch and the players are rather drab. However, the fast scrolling and ultra-fast play are still there – the game is every bit as exciting, playable and addictive as the console version.

Dribbling the ball couldn't be easier. Once you've 'trapped' the ball, you simply run across the pitch and the ball stays at your feet. Your opponents won't stand for this, though, and a well-timed tackle will see you lose possession.



• ***Gazza II on tape looks a tiny bit drab compared to the cartridge version, but it's just as fast and playable.***

So you have to avoid attacking enemy players by passing the ball to your other team-mates. Unusually for a footie game, passing can be quite a controlled manoeuvre. The joystick controls the direction of your pass, and then all you have to do is decide the strength of the kick by varying the length of time you hold the Fire button down. It's really simple in principle, but so effective in practice.

While the bulk of the screen is given over to the playing area, below it is a scanner showing the position of all the players on the pitch. It's a nice touch, but unless you can use both eyes independently, I'm not sure it's too useful! Taking your eyes off the on-pitch action for an instant can be disastrous, such is the pace of the game.

Gazza II is brilliant, but it's flawed

Continued on next page ➤

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too. You can only kick in verticals, horizontals and diagonals, and the goalkeepers are practically useless. Some of the throw-in decisions are decidedly dodgy, too. (What do you expect when there's no ref?)

However, as a two-player game, *Gazza II* is still almost unbeatable for simple, fast fun.

SUPER MEDDLER TIPS

David Cardus of Tallington has found out some fascinating information about *Bonzo's Super Meddler*. The disk contains a file called **FBAUTO2.BAS**. Running it sets up no fewer than 47 RSXs (Resident System Extensions). Type **|HELP** and you get a list. However, many require you to input parameters.

Here are some of the ones David has managed to work out:

- IM.FILL/address/length/byte – Fills an area of memory with a byte starting at the address given.
- IM.MOVE/address/length/byte – Copies an area of memory from starting address to the new address.
- IDEPRO/filename$ – Loads a protected BASIC file into memory.
- IBIG/text$ – Prints double-height text.
- IBORDER– Using the up and down keys you can change the border colour, confirming your choice with the COPY key.
- IINK/ink number – The same as IBORDER except for the inks.
- IBOX/x,y – Draw a box from the origin to coordinates (x,y).
- ILINE/a,b,x,y – Draws a line from coordinates (a,b) to (x,y).
- IINPUT/input type/a$ – For 'input type' you put either 0 or 1 for numeric and alphanumeric information respectively. This prints the string a$ in a box allowing you to edit it. When you press RETURN the string is saved as altered.
- IPAUSE/x – Pauses the computer for x multiples of 0.5 seconds.
- IP.CDUMP – Dumps the contents of the screen to the printer.
- IP.ON & IP.OFF – Echo from screen to printer is turned on and off respectively.
- IS.LR/x and IS.RR/x – Screen is scrolled left or right respectively and wrapped onto the other; x is the number of text divisions.
- IS.L/x, IS.R/x, IS.D/x and IS.U/x – Scrolls the screen x units to the left, right, down and up respectively.
- ISLEEP – The computer stops until a key is pressed.
- IMENU/character/number of options/memory of locations – This is used where you have on-screen a list of options (menu). You move the specified character up and down with the cursor keys. When the character is next to the option you want press COPY. The relevant number is then stored at the specified memory location.
- ICOLOUR and IGREEN – These set up two different palettes for the VDU.

Rod Lawton

Rod Lawton is the editor of Amstrad Action, *the magazine packed with CPC new, reviews and features every month.*

MACINTOSH

- **Are we being ripped off when it comes to upgrades?**
- **A M Micro launches maths co-processor for the LC**
- **New monitor that allows you to hide your Mac**

SOFTWARE RIP-OFF

Why does it seem that certain software companies are ripping us off? The answer is because they are. I'll use one company as an example, but there are several others who are just as bad.

The company in question produces a popular anti-virus detection program. Of course, every time a new virus is discovered, the program needs to be updated, so the company kindly offers a scheme whereby, for about £70 per year, subscribers receive updates to the program as they become available.

A friend did just that – he subscribed to the scheme at the beginning of the year, and sat back and waited for his upgrades to arrive. So far he's received one.

OK, not many new viruses have appeared in the last few months, so the program hasn't needed updating. He feels that he made a bit of a mistake by subscribing, but was confident in the knowledge that, should a new virus appear, he'd receive a new version of the program almost immediately.

Then, a couple of weeks ago, a mailshot appeared through his door, advising him that Version 3 of the program is now available – at a cost of just £70 to all registered users of version 2.x.

Rather surprised that he should receive this mailing, my friend rang the company in question, pointed out that he already subscribed to the upgrade service, and asked when he could expect to receive his copy of version 3.

"Oh, no," said the software house. "Your upgrade subscription is only for version 2 of the program. Version 3 is quite different."

"But isn't it just an upgrade to your anti-virus program?" asked my friend who, by this time, was rather peeved.

"Well, yes," they replied, "but it's such a major upgrade that it isn't covered by your subscription."

Even better, my friend then asked whether, if he were to pay the £70 and upgrade to version 3 of the program, his upgrade subscription would then 'carry over' to this new version.

"Oh no," they replied, "your subscription is only valid for version 2."

This leaves my friend – and, I suspect, thousands of others – in the

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rather unenviable position of having to pay £70 for the upgrade to the program and then yet another £70 for a year's subscription for version 3 upgrades.

Of course, he could just stick with the version he's got – but is the company going to continue supporting an outdated version for too long?

Who knows – but I think that my friend has decided that from now on he'll use the free, and excellent, *Disinfectant* program rather than a commercial offering. *Disinfectant* works just as well, and upgrades appear (free) within days of a new virus being discovered.

The point is this: software companies – especially those concerned with anti-virus programs – have users over a barrel with regards to upgrades. You either pay through the nose, or make do with an old, buggy, version.

No-one minds paying for an upgrade if it's a major improvement on the program but what really galls is having to pay for minor updates and bug fixes. Software companies should realise that sooner or later people are going to get fed up with this kind of profiteering and will shop elsewhere.

There are, of course, many exceptions. Altsys, for instance, offers upgrades to its *Fontographer* program at very little (or no) charge to registered users. It is, however, in the minority.

HARD SUMS ON THE LC

AM Micro distribution has announced a Maths co-processor for the Macintosh LC. The LC doesn't come with one as standard, so it is incompatible with some programs (such as Microsoft *Excel* 2.2 and earlier versions of *Studio/8*). The lack of a co-processor also means that any maths-intensive programs run far more slowly.

Apex LC should cure all these for just £239. According to its distributors, it will run applications which are specifically written to take advantage of a maths co-processor between five and ten times faster than the basic Mac LC.

☎ AM Micro is on 0392 426473.

NEWS FROM APPLE

Apple's PR company seems to have gone mad – new press releases seems to be arriving every day.

First off is Apple's new 21 inch colour monitor, for the Mac IIsi, IIci and IIfx. It offers three times the viewing area of a standard 13 inch monitor and around 27 per cent more viewing area than most 19 inch monitors.

In an interesting move, Apple has built ADB ports into the front of the monitor so that users can plug the keyboard and mouse straight into it and hide the actual Mac out of the way on the floor.

The new monitor will start shipping at the beginning of July this year; suggested retail price is £3,295.

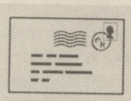
The other major news this week is that Lotus is to ship a version of *1-2-3*, the standard PC spreadsheet, for the Macintosh this autumn.

It's an interesting – and brave – idea. Although *1-2-3* has been the most popular spreadsheet on PCs for years, Macintosh users have generally standardised on Microsoft's *Excel*. And with Claris having just launched *Resolve*, market, the question is whether there is enough room for yet another competitor.

Lotus' big disadvantage is that Mac users do not know the company name – they're far happier with names like Claris and Microsoft – so look out for a massive publicity and public awareness campaign in throughout the Macintosh press 'Real Soon Now', in anticipation of the launch.

Ian Wrigley

POSTCARD FROM AMERICA



Many programs, especially word processors, are bundled with utility desk accessories. Most of them are crippled to only work with a specific software package. If you want a thesaurus, or dictionary to work with all your programs, you need to buy it separately. Unfortunately, almost all of these product specific versions break under System 7.

The software that kept track of desk accessories, DA Handler, has been sent out to pasture with the new operating system. When the DA is run, it bounces back with a message saying it will only work with its bundled program – even if that program is running. As you might expect, the message also contains an ad for the expanded, universally usable version. What to do?

The answer comes from the good ol' days of the Macintosh, before *Suitcase* and *Font/DA Juggler*. The System file was limited to only 16 DAs, and people didn't want to waste valuable slots, or care to always view desk accessories that they could only use with one program. The *Font/DA Mover* program had a hidden feature to allow users to insert fonts and desk accessories directly into applications.

***Launch Font/DA Mover* – version 4.1, the last before the introduction of System 7, works fine. If you're using an older version, boot under System 6.0x to perform the operation. Hold down the OPTION key when clicking on the OPEN button. Instead of a font/DA-exclusive list, magically everything becomes available to be opened. Copy the problem DA into its companion application, and everything will now work fine under System 7.**

Some power users are complaining that their favourite Command key equivalents have vanished. The most missed is Command-e, which would eject and unmount a floppy disk. It's the same as dragging it to the Trash.

Don't fret, it's only undergone a name change. Command-y performs the action. The interface gurus felt that "PutAway" went better with the y-key.

David Morgenstern

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U. PowerPacker 2.3b
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G. Star Trek (T.Richter) (2)
A. Fillet of Fish
G. Return to Earth
A. Station at Khern (3)**
D. Fractal Flight*
D. Armageddon Demo*
A. Raiders of Lost Ark Anim*

A. Madonna Cartoon
D. Coma Demo
A. The Run Animation*
G. Train Set
G. Jeopardy
M. Phil Collins Demo
S. T.Richter Slideshow (2)*
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A. Bust Animation
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M. Music Madness Disk
D. Phenomena Interspace
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M. Bard in a Box
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Key:- A-Animation, D-Demo, G-Game, M-Music, S-Slideshow, U-Utility. (2)-2 Disks, (3)-3 Disks, *- 1 Meg, **- 2 Meg.

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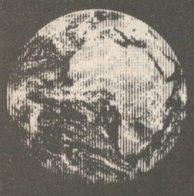

Around the world in seven seconds. This week our man on the move, Steve Gold, tells us of hacker arrests in the US, an on-line system in the air, Philips' HDTV system's early debut and all the latest international news

NINTENDO GAME COUNTERFEITERS ARRESTED IN US

Seven people in four US cities have been arrested for allegedly manufacturing and exporting counterfeit Nintendo video games. Nintendo America has announced that the suspects are linked with several major Taiwanese companies.

Unusually, the arrests were made by the US customs service in Chicago, San José, California, Los Angeles and Miami. According to Nintendo America, the people arrested were Patrick Yu and George Yeh of United Microelectronics Corporation; Uen Fu Wong and Jimmy Yao of NT-Dec; King Huan and Alice Chang of King Hwa Industrial Corporation, and Joseph Benmeleh of Galaxia Overseas.

Nintendo officials said that the arrests relate to criminal charges against Danny Chu of Aeropower of Taiwan and Tina Huang of Rainco Man International, also of Taiwan.

According to on-line sources, the arrests will almost certainly mean the end – for the time being at least – of cheap imports of counterfeit Nintendo games cartridges into the US. This will have a knock-on effect on the import of these cartridges into the UK from the US. Buy now while stocks last!

• Nintendo games – the end of bargain imports of counterfeit cartridges from the US to the UK is imminent.

NOTEBOOK WITH MOUSEPAD DEBUTS AT PC EXPO

Aquiline, a Bennington, Vermont-based PC clone specialist, will announce a 4.5 pound notebook PC with a built-in mousepad at PC Expo in New York at the end of June.

The $3,995 machine comes with 1Mb of RAM (expandable to 4Mb internally) plus a 20Mb hard disk. Despite this, the machine is just 1.33 inches thick and is driven by a 20MHz 80386SX microprocesssor. Other features include serial, parallel and mouse ports, as well as an external VGA output socket.

The crowning glory to the high-spec, low-price notebook is a 10-inch supertwist, sidelit VGA LCD screen, and the wealth of ROM-med software that comes built-in – Fastlynx (a file transfer package), Fastlock (a security package), battery alert, and a phonebook module. Also bundled with the machine is DOS 4.1 and a copy of Microsoft Works or a copy of Windows 3.0. Not bad value.

Contact: Aquiline, 449 Main Street, Bennington, Vermont, VT 05201, United States. Tel: 0101-802-442-1526 Fax: 0101-802-442-866.

GETTING ON-LINE IN THE AIR

Need access to an on-line system in the air? No problems if you're flying aboard a plane equipped with French Telecom's Aircom satphone system. The communications giant is offering airlines the chance to install its pay-as-you-go satphone system that allows calls to be made from all over the world.

The system, the first of its kind in the world, was developed by French Telecom with the help of OTC of Australia and Teleglobe Canada, and is known as Aircom. Unlike competing airphone systems, which use analogue ground relay links, the Aircom system transmits directly to one of several dozen satellites circling the earth. Because of the band width available, full digital calls are possible, so modems and fax transmissions can be used with the ease.

Pricing on the Aircom system is a dollar a minute which, although not cheap, does allow you to make call from anywhere in the world, except if you're flying over the north or south poles.

US COMPUTER HACKER GETS A YEAR AND A DAY INSIDE

A top US computer hacker has been sentenced to 366 days in prison for stealing information from American Telephone & Telegraph (AT&T) and its subsidiary Bell Laboratories.

Leonard Rose Junior, 32, an unemployed computer consultant, has pleaded guilty to a single count of sending AT&T source codes via modem to a fellow hacker in Illinois, and a similar wire fraud charge involving a Chicago hacker. Rose was once a member of US hackers' group called the Legion of Doom. He was originally indicted on charges of computer fraud and interstate transportation of stolen property, but those charges were dropped under a plea bargain with the US government.

In court, US district judge Frederick Motz ordered Rose to sell his computer equipment, which was seized last year in a raid on his house in Middletown, and to tell potential employers of his conviction. He will begin serving his sentence on July 10 this year. The judge in the case did not order Rose to pay compensation to AT&T because he has what one of his lawyers called "a negative net worth."

US 'SUPERMAN' COMPUTER FORGER INDICTED

Remember the `Superman' film bit where the crook slices a little bit off everyone's pay packet and siphons all the resultant cash into his own pay packet? Well, it seems that fiction has turned into truth as, over in Richmond, Virginia in the US, a grand jury has just indicted a clerk on charges of computer forgery in a similar case to the Superman film.

Diane Murphy, a 51-year-old payroll clerk from (ironically) the Department of Correction has been charged with altering computer data and obtaining $1,500 by deception as a result.

Murphy's arrest is the latest result of a special audit of Virginia's computerised payroll system. At least eight state employees have been fired since the audit, which found clerks taking advantage of a new computer program. Corrections Director Edward Murray said that Murphy's arrest stemmed from a special investigation that led to the firing of three other department payroll clerks in early May. According to Murray, audits of payroll records showed that the clerks had given themselves pay to which they were clearly not entitled.

US DATA BILL WITHDRAWN

A US Senate Bill restricting some forms of electronic data transmission has been withdrawn from consideration. The action came after US government officials met with representatives of the Electronic Freedom Foundation (EFF).

The EFF was founded by Mitchell Kapor and John Barlow, two US computer industry gurus, in order to support litigation in the public interest to protect `First Amendment' (freedom of speech and actions) rights in computing. The proposed legislation would have prohibited individuals from using encryption programs on data sent via Email.

The US on-line world is not out of trouble yet. According to EFFector Online, an EFF electronic publication, the proposed legislation will be replaced by a new Omnibus Crime Bill which will impose slightly less draconian rules on US Email services and their subscribers. ■

PHILIPS TO LAUNCH HDTV SYSTEM A YEAR EARLY

Philips Electronics, the Dutch electronics giant, has announced it will launch a range of high-definition television sets in early 1994, a year earlier than the scheduled large scale introduction of the product. "We are technically ready 12 months ahead of our original 1995 schedule," said Peter Groenenboom, senior managing director of the Philips Consumer Electronics International division.

Groenenboom credited the earlier release date with a recent agreement negotiated by the European Commission (EC) between broadcasters, satellite operators and electronics companies that established the D2- MAC satellite broadcasting standard as a forerunner to the full HDTV standard. The group has also agreed to establish a standard 16-to-9 width-to-height for screens. "As D2-MAC 16-by-9 sets share many of the same components and technologies as HDTV receivers, Philips expects to achieve economies of scale which will make HDTV sets feasible within a shorter timeframe," explained Groenenboom.

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C088 Disk B to above
C093 Bacteria demo
C101 Sonix classix
C108 Digital concert 3
C113 Sonix No.17
C130 Budbrain demo 1
C131 Disk B to above (18)
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C143 Digital concert 5
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C193 Disk B to above
C194 Disk C to above
C198 Star trekking disk A 1 Meg
C199 Disk B to above
C200 Xmas carols
C201 Good Morning Vietnam
C210 Alf demo 2
C229 Hot wired
C236 Turtle demo by sector 16
C244 Amazing Tunes disk A
C245 Disk B to above
C246 Disk C to above
C248 Budbrain 2
C303 Startracker V1.2
C305 Sonix No.5
C308 Zenn sound box
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C327 Turtle power disk A
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C380 Mucky Morris & the Cowpats
C410 Digital Concert 2
C411 Digital Concert 3
C412 Digital Concert 6
C416 Blues Brothers disk A
C417 Disk B to above
C418 Disk C to above
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C426 Disk B to above
C428 Smith & Jones 1 (18)
C429 Smith & Jones 2 (!8)
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Min order 5 disks

More disks are in the collection, too many disks to list here. Last count over 900.

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E032 Boot block makers disk 1
E034 Printer utilities 2
E045 Business card maker
E046 Viruscope (good)
E051 Ncom V1.9 (modem util)
E056 Tetracopy
E057 Catalogue Workshop
E063 C Manual
E070 QL Emulator
E071 Disk B to above
E072 Disk C to above
E074 Spreadsheet
E083 Master virus killer
E088 Textplus word processor
E094 Flexi Wosname database
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E114 Slideshow construction set
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D013 Peters Quest
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F126 Disk B to above
F127 Disk C to above
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F164 Tobias richter slideshow
F165 Disk B to above
F166 Lost In Space Anim 2 Meg
F167 Disk B to above
F168 Disk C to above
F170 Batman the movie 1 Meg
F173 Juggler meets the lady
F174 Fantasy space slideshow
F176 Mandlebrot generator
F179 Iraq demo 1 Meg
F180 Amy the Squirrel at the Movies 2 Meg
F190 Tron Anim 1 Meg
F191 Disk B to above
F200 Robin Hood slideshow with music (Cartoon)
F209 Life of Brian slideshow with samples from film
F219 Franklin the Fly anim
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TECH TIPS

Have you got a printer tip to share? Can't you get your PC to run Spectrum software? Is your Apricot getting you in a jam? Keith Pomfret can help you with all your technical hang-ups

TIP! Emu-later

In *Express* 51 reference was made to the development of a Spectrum emulator for the Amstrad PC. Subsequent issues have made passing references to this and in issue 85 the news was that such an emulator was under review at the *Express* offices.

In issue 101 you reported that you, "saw it, tried it, it fell over. We tried it some more. it fell over some more. Now we're waiting for a version that works."

Well, I have been religiously watching your column since then, but no joy. Has it finally given up the ghost, or do I still live in hope?

Richard Roberts, Norwich

• With all that lovely PC software out there, who would want to run Spectrum progs on this powerful machine? Richard Roberts would, that's who.

We still live in hope. We were promised another emulator but the chap who writes them obviously lives on a slower processor than us and as yet hasn't felt able to offer the completed and un-bugged version. However, rumours are rife about an improved version running on most PCs except Amstrads. Perhaps the technical wizards at Amstrad towers in Brentwood have cast a spell on it to keep the Spectrum flying ...

HELP Apricot jam

I have been given the opportunity of buying an Apricot F1 computer at an extremely tempting price. Unfortunately my knowledge of this machine is limited, and I wonder whether you could answer a few queries for me?

I intend to use it mainly for producing a magazine, and so I will need a graphic text output program. A full DTP package would be perfect, but just something to to do simple layout, such as columns, would be sufficient, allowing me to 'paste' the pages together. I already have a word processing package.

Also, will I be able to connect a standard Epson compatible parallel printer directly to the computer, or will it be necessary to obtain a special lead/interface? If so, where can I obtain them?

Simon Daniels, Northants

The Apricot F1 was one of the early MS/DOS machines that shared its operating system with the PC and not much else.

When it was launched it was hailed as an innovative computer. It had 256K of memory which in those days was huge. The keyboard worked by sending an infra red signal to the main unit and it had all the features needed to run most of the software available at the time.

The F1 went through various upgrades which took it from being a totally incompatible machine to being a slightly less incompatible machine. Later F1s can read PC data disks and some have enhanced displays that can handle certain PC software.

It's perfectly possible to find an F1 with one floppy, two floppies, a floppy and a hard drive, colour or mono display, and various configurations of system (BIOS). I have never seen any DTP program that will run on an F1. I seriously doubt whether any graphics intensive program will run on an F1 which is a shame.

Things that I have used on an F1 are a drawing program, a word processor, the operating system CP/M86, terminal software for logging on to bulletin boards and a small database.

The parallel port on the F1 is standard and any printer for which there's a printer driver available for the F1 should work on it. The serial port is standard too and will support serial printers and modems.

HELP Stand up STs

I have some basic queries which I would be grateful if you could resolve.

First, a plea for information. I recall reading in a magazine many months ago about 'Expansion kits' from Germany which would transform the standard single unit 'Atari ST' computer into a separate processor and keyboard affair as in the case of the 'Mega ST' and in a similar manner to the A1500 kit for the 'Commodore Amiga'.

I have since seen no further reference to such kits for the ST, and ask if you could find out about availability, cost and ease of conversion (ie is an STE compatible with such a kit). Are there any British distributors who would be willing to import kits given sufficient demand?

I also believe that sets of replacement keys can be obtained for any ST (possibly also from Germany) and are designed to give better performance as well as cosmetics – any change to an ST's function keys would be gratefully received for instance! Do you know of any such kits?

Austin Blackburn, Wormley

There is a kit, it comes in three variations for the FMs and STEs, Megas, and Ms. It's called the Lighthouse Tower system and it costs £199.50 for the FM/STE version from Atari Workshop on 0753 832212. We're waiting for our review model to arrive and as soon as it does, we'll be doing a detailed build up in Circuit City. ■

Write to Keith Pomfret,
Tech Tips, *New Computer Express*
30 Monmouth Street, Bath BA1 2BW

TIP! Hot codes! Get your JP101 working with an Electron

Many aeons ago, I bought an Olivetti JP101 Printer for my Acorn Election, mainly in the hope of using it as a successful word processor. For its cheap price, I was quite impressed. However, I found that it did not run under standard Epson codes for underlining or any other font techniques.

As most printers run using Epson codes, I was stuck until I modified my existing programs with the codes given in my manual, which are listed below. Although the JP101 will now work with my Electron, I have had no success with my Amiga under its Printer Drivers with the JP101. Despite this, I have written to Tech Tips in the hope of helping Andy Reeves *(Express* 134), and in giving the codes, I hope it will allow him to use the printer with his PD Driver Creator.

CONTROL CODES
ESC 0 : General Reset
ESC " : Double Height Character ON (1/11 – 2/7)
ESC % : Double Height Character OFF
ESC 3 : Double Width Characters ON (1/11 – 3/3)
ESC 4 : Double Width Characters OFF
ESC < : Horiz. spacing 10 Chars per inch (1/11 – 3/12)
ESC = : Horiz. spacing 12 Chars per inch (1/11 – 3/13)
ESC > : Horiz. spacing 18 Chars per inch (1/11 – 3/14)
ESC E : 1/6 Vert. Spacing (1/11 – 4/5)
ESC F : 1/8 Vert. Spacing (1/11 – 4/6)
ESC * : Underlining (1/11 – 2/10 – 3/1)
ESC + : Cancel Underlining
R – 'D' – J

Thanks for the codes which should help Andy Reeves get started. If you're having problems getting the printer to work with your Amiga, why not give our sister mag ***Amiga Shopper*** a ring on 0225 44224. It's jam-packed with technical advice for the serious Amiga user. Our old Dep.Ed, Stuart Anderton, now occupies the big chair so phone him for a chat. The next issue's out the first week in July.

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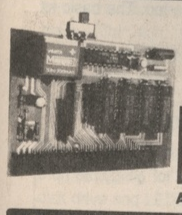

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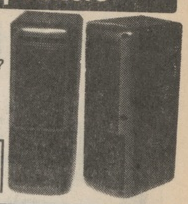

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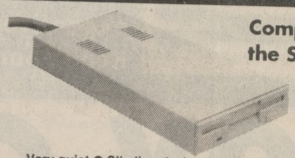

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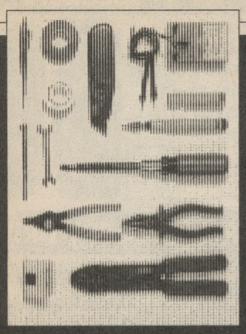


CIRCUIT CITY

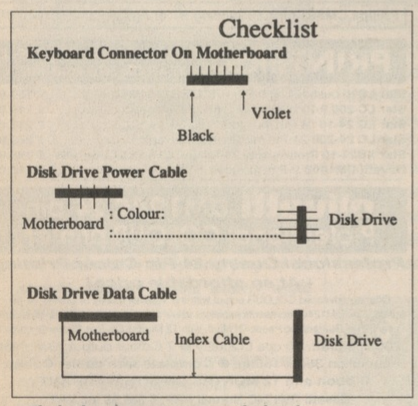
You can give your Amiga A500 a brand new body without resorting to expensive plastic surgery. And what's more it's a dead simple process. Keith Pomfret takes out his trusty tools to give his Amiga a full metal jacket

BOX CLEVER

PRODUCT: A1500 expansion kit
MACHINE: Amiga
FROM: A1500 Ltd
CONTACT: 081-907 3636

The A1500 is an expansion kit that lets you take the internal parts of an Amiga A500 and replace Commodore's plastic case with a solid metal box with room for expansion. The keyboard gets a separate box and is connected to the main box by the predictable curly cable. The whole thing is only 19 inches wide and with a conversion kit can be rack mounted.

It comes in a robust cardboard carton with all the parts, screws, connectors and twiddly bits necessary to convert your A500. All you need to provide is a couple of hours of your time and the most basic tools. There is no soldering and the most complicated job is lining up a disk drive behind its slot. Anyone who can read and find the business end of a screwdriver can build an A1500.



• *The keyboard connector on a motherboard.*

WHAT'S A 1500?

When Checkmate Digital started distributing a product called A1500 last year, there was no confusion. It was an upgrade kit for the Commodore Amiga A500 which allowed you to take all of the components from your A500 and place them in a new case with a separate keyboard and more room for expansion.

The best laid plans were disrupted by Commodore with its Amiga 1500 which was a variant of the existing 2000 series which also had a separate keyboard and expansion potential.

To add to the confusion, the A1500 is now distributed by A1500 Limited and a range of extras compatible with it are distributed by Checkmate Digital.

GOOD DOCUMENTATION

Everything in the box is identified in the instruction manual which includes checklists and illustrations to guide you through the job. The build starts with the dissassembly of your A500, and the instructions take you through a checklist that shows you the correct way to dismember your A500 and importantly, reminds you about the orientation and polarity of the various cables that need to be removed and replaced.

The orientation of the ribbon cables within the A500 is illustrated and there's a diagram of the motherboard showing where these connectors come from.

Once your A500 is lying in bits on the table, you'll have the parts that you need and the case which you don't. You may feel that your Amiga will never need Commodore's plastic box again but we felt that it should be kept. If at some time in the future the Amiga had to be sold, the ability to offer it as either a bare A500 or an upgraded A1500 could only be an advantage.

SHELL-SHOCKED

The robust metal box that the insides of the A500 are built into to turn it into a 1500 is known as the shell. It is made from thick sheet steel and is cream in colour.

With the A500, the joystick and mouse ports are at the rear. To bring them to the front of the A1500, ribbon cables are attached to them on the motherboard and then fed back through the box to a pair of connectors at the front.

If you have a memory expansion in the trapdoor under your A500, the instructions include a warning about insulating the rear of the memory expansion board from the metal shell of the A1500. Those people who need occasional access to the trapdoor in order to disable the memory to use certain programs that don't like the extra 512k will be disappointed.

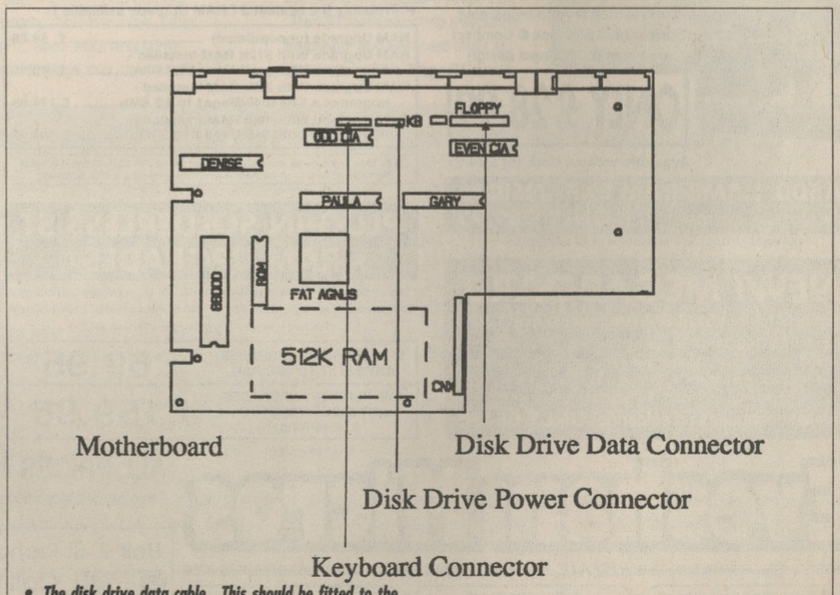
The motherboard is laid in the base of the shell on top of its insulating template and secured using half a dozen screws.

A socket in the front of the base is connected to the keyboard bus on the motherboard to allow the remote keyboard to be connected to the case directly.

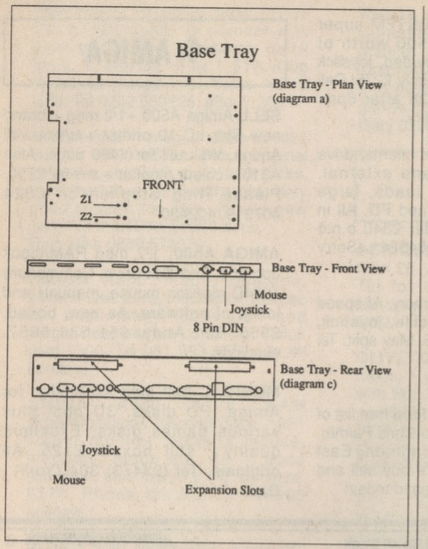
FITTING THE DRIVES

The disk drive of the A500 moves from the side to the front and a ribbon cable supplied in the kit is used as it is further away from the motherboard in the A1500. the drive fits on a purpose designed 'saddle' with adjustment up and down and fore and aft.

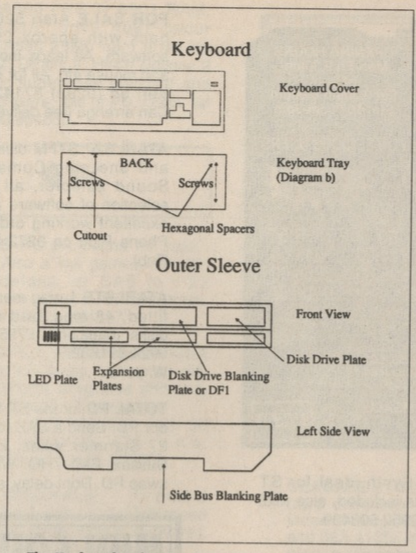
The initial fitting of the disk drive is simple enough with final adjustments coming later when the top half of the case is added. There's room inside the A1500 for a second floppy drive and a hard drive too. The basic kit



• *The disk drive data cable . This should be fitted to the drive along with the disk drive power cable.*



• *The Base Tray – Plan view (top), Front view (centre), Rear view (bottom).*



• *The Keyboard and outer sleeve – once they are assembled your A1500 expansion system is ready for use.*

doesn't come with the components to add these drives. They are available separately so you only buy the components that you require. If you are going to add more drives though, now is the time to do it.

The second disk drive kit replicates the saddle, cables and fastenings of the first drive and sits alongside it facing the front of the machine. If you aren't fitting a second drive, there's a blanking plate so you don't end up with any ugly holes in the front of the A1500.

Anyone who can read English and find the business end of a screwdriver can build an A1500

This idea is carried right through the kit with several ports and holes covered by blanking plates until an upgrade is fitted. Each additional add-on comes with its own instruction book and these are installed at this point. After that, the remaining blanking plates are secured and it's time to marry the top and bottom halves of the shell.

GETTING IT TOGETHER

This is a simple matter of sliding the top half over and then struggling for half an hour or so trying to get the disk drive and LEDs to fit into the little slots at the front for them. It is a fiddle, but in the end everything fits.

After assembling the main shell there's the keyboard to assign to its new home in a separate box. A couple of brass spacers saved from the A500 disk drive locators are used to prop up the rear of the keyboard in the lower tray-shaped half of the box and give it a rakish angle. The cable lies in the rear of the tray and is fed through a grommet to a flexible curly cable that attaches to the main shell via a DIN socket at the front.

Locating the keyboard is a bit of a fiddle but it's soon done and two large rubber feet at the rear and two smaller at the front increase the angle of the keyboard to a usable height and slope.

There are four large rubber feet for the shell and once they're attached, the unit is ready to use.

The design means that there's room on the front of the shell for another port and it's possible to feed a ribbon cable back through the shell from the rear to do this. This could be useful for, say, a switchable MIDI interface where it would be much easier to have the switches at the front of the system unit instead of buried around the back.

RACK MOUNTED

If you intend to mount the A1500 in a 19 inch rack, there's a further kit to buy which is a metal sleeve with rack connections and handles. The A1500 is attached to the sleeve with screws and then the sleeve is inserted in the rack and fastened in the normal way. One slight problem of the rack upgrade is that the keyboard to shell cable is too short. If you mount it high in a rack or the rack a distance from the keyboard, you'll have to think about extending the keyboard cable.

VERSATILE COST-EFFECTIVE UPGRADE

The A1500 is a reasonable upgrade path for a reasonable amount of money. It will destroy your warranty but the one that we built at *Express* and a couple more that we examined were all working fine with the Amiga quite happy in its new metal jacket.

One of the others that we looked at had an external hard drive which mated with it through an expansion port in the side in the same way that a Commodore A590 mates with an A500.

The other one had the hard drive built internally and was mounted in a rack driving a MIDI studio. With 2Mb of RAM, a hard drive DR T's MIDI software and mounted in a 'rack on wheels' with five multi tymbral sound modules, it was a completely portable MIDI system that could be wheeled around the studio complex or even used live on stage.

A simple upgrade, a serious Amiga and a compact portable studio are three completely different uses that we have seen the upgrade kit put to. At around £230 it is the next thing to save for after the second drive and 512k RAM expansion.

THE ALTERNATIVES

There is more than one way to skin a cat or for that matter to upgrade an Amiga. The official Commodore route is to upgrade an A500 to 1Mb by either adding a 512k expansion under the trapdoor or having it fitted on the motherboard by Commodore. After that, if you want to upgrade any further, you need to dispose of your A500 and give Commodore some more cash for an A1500, B2000 or if you're really flush an Amiga 3000.

Commodore frowns on the DIY approach to upgrade and has even been known to threaten to disown a warranty for an unnofficial upgrade in the trapdoor. Commodore is on 0628 770088

If you are going to build it yourself, you've two choices. There's the Bodega Bay which is attached to an A500 by simply sliding the A500 on to a connector via the expansion bus. This takes a couple of minutes and offers B2000-type expansion for the A500. It is a simple job, but neat and small it isn't. Bodega Bay looks like a teleprinter and is very greedy of desk space although it performs very well indeed. Bodega Bay comes from Amiga Centre Scotland on 031 557 4242.

Second choice is the versatile A1500 that we've built for this issue. It takes a bit of time and thought, but it isn't too complicated and the instructions are comprehensive and well illustrated. ■

BYE-BYE WARRANTY

As soon as you wave the magic screwdriver over your Amiga, you can kiss the warranty goodbye. Commodore insists that it will only honour obligations to machines untouched by human hand, screwdriver and soldering iron.

Once you've opened the A500 up you're on your own without the support of the manufacturer so don't undertake this sort of major surgery unless you are willing to take that responsibility.

SAFE AND SECURE

If you're working inside any electrical appliance, it goes without saying that you should first unplug it. The first thing that you should do is remove the Amiga 500 power supply and place it somewhere that you can't 'just plug it in to test something'.

Testing should be done with the machine re-assembled, not open with any components showing. it may seem picky but it can avoid your relations having to bury or cremate you.

COST OF EXPANSION KIT

All prices include VAT

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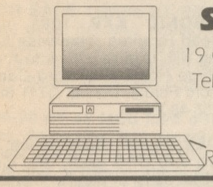

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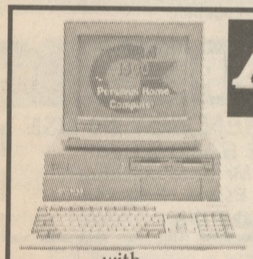

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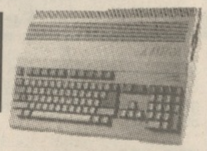

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THE GAMES machine magazine issues 1-33. As new £15 the lot. Contact Stephen, 8 Roddens Gardens, Castleagh, Belfast, BT5 7JJ or phone (0232) 798559.

`BPCW 8256/512 software Deskop Organiser "Compilation" £15. Steve 071 431 1204 NW London.

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COMPAQ portable III owner would like to talk to someone with the same machine. As I received no manuals or setup disks. Please help. Phone Dave, evenings after 18.00. 0634 863340 or work hours 0622 683044.

WANTED BBC B software and Chips disk drive, monitor. Phone 0602 233955, after 6pm week days or weekends.

A.C.E. MAGAZINE issues No 1-44 excellent condition £15 the lot. Contact Stephen, 8 Roddens Gardens, Belfast, BT5 7JJ or phone. (0232) 798559. Also Atari ST Elite £10. Balance Of Power £8.

PHOTOS converted into Degas for Neo Formats on your ST. Ring Haywood Milton Jun on 051 724 4847, after 7pm. Working days only. House? Car? Pets Family? All look great.

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ACORNSOFT Micro Prolog ROM for BBC-B £10 + £1 postage, books sale, Apple Pascal games, good software guide for Spectrum. £2 each +£1 postage. Tel: 081 807 8157.

STUDENT needs (dirt) cheap, Spirit Duplicator (£35ish) or (dirt) cheap photocopier £50-£100. Not bothered about condition, make, capabilities (although must be working). Can anyone help? If so, please phone me any evening on (0634) 723659.

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THE PLACES TO BE . . .

MANIFEST 20 June
Manufacturing Initiative For Expert System Technology at SD-Scicon, Milton Keynes. Info: 0276 686 200.

CTC Open Day '91 25 June
A chance to see the City Technology College in Birmingham, a college that aimes to raise the expectations and aspirations of deprived working class children. Info: 021 770 8923.

Multimedia '91 25-27 June
There will be a special seminar called 'Multimedia in European Museums', including speakers from New Media Productions, the Institute of Archaeology, the European Commission, and the Tate Gallery in Liverpool. It will be held at the Olympia, London. Info: 081-868 4466.

OIS IMC '91 2-4 July
The document image processing conference at the Wembley Conference and Exhibition Centre, London. Info: 071-931 9985.

PC World Forum 9-14 July
In Moscow. Info from Terence Coe on 010 1 508 820 8122.

International Music Show 10-14 July
Midi equipment and software galore, at the Olympia, London. Info: 071-730 7852.

The International 16-bit Computer Show 12 July
At the Novotel Hotel, Hammersmith, London. Info on: 0726 68020.

GeoCon '91 11-13 August
A conference designed to give software developers from Europe, Canada, Asia and Latin America the opportunity to find US distributors. At the Sage Howard Johnson Hotel, Cambridge, MA, USA. Info: 010 32 03 234 3180.

Computer Animation Competition and Exhibition 21-28 August
At the Amiga Centre Scotland. The winners' work will be exhibited as part of the Edinburgh Festival. Members of the public will be able to make their own animations in a 'workshop' environment. Entries, which must have been created with an Amiga, should be submitted either on a floppy disk or PAL video tape. Closing date 31 July. Info: 031 557 4242.

Leeds Computer Extravaganza 13-15 Sept
At the New Exhibition Centre at Leeds University. Info: 0532 677 657.

Business Communications Awards 10 October
At the Savoy Hotel, London. Entries from interested companies must be in by 15 July. Info: 0800 800 847.

Image Processing '91 29-31 Oct
At the Birmingham NEC. Info: 081-868 9933.

Computer Graphics '91 5-7 Nov
At the Alexandra Place in London. Info: 081-868 9933.

Desktop Cad '91 5-7 Nov
At the Alexandra Palace in London. Info: 081-868 9933.

Computers in the City 12-14 Nov
At the Barbican Centre in London. Info: 081-868 4466. ■

The Insider . . .

A brief but regular look at the news and views of an industry which is desperate to be loved and then respected in the morning

Who wants a fiver then? If you have a yen - pun intended – to get a blue beer token in the hand, send in some computer related gossip to: The Insider, *New Computer Express*, 30 Monmouth St, Bath, Avon BA1 2BW. Everything is read with interest.

BOARD BITLESS

People get so tired and niggly when it comes to money, don't they? From what the Insider hears, this state of mind has extended to attempting to use the Press in a battle of wallets.

A reporter on our sister title *ST Format* received a call from Mr Ali Shah at Gasteiner. Mr Shah informed the overworked hack that 140 copies of *PCspeed* and 40 copies of ATspeed emulators for the Atari ST had been returned. The reason for this, according to Mr Shah (and we must point out, unverified by The Insider which would like to make it clear to all readers that no blame or criticism is aimed or inferred at the wholly excellent *PCspeed* and ATspeed products, or Mr Shah) was that they had exploded causing damage to the STs.

What a story! Thought the *Formatter*. So he followed it up with a phone call to some distributors of the products. One respected companies told him that it had never heard of such a thing. Has your AT or PCspeed board blown up? Write and tell us.

HUNCH IS FOR GIMPS

So Sony and Philips signed a deal licensing *Super Mario Bros* for the first time ever. And they did it in a hotel room over a few hours. And Sony didn't get a look in. Just what is going on among the corporate giants? The whole thing sounds like a rather bad screenplay for a late '80s 'lunch-is-for-wimps-'em-up' to the Insider.

BOARD BITLESS

Yet more hackers and crackers on the phone this week. This time from Stockport. It appears that when the spotty little goons are not sitting in darkened rooms away from real people, they are plucking up the courage to make intimidating phone calls to the Press.

The phone-call went something like this (it has been expurgated by the powers that be): "You don't know what the **** you're ********** going on about. You ********. We're looking for you, we'll find you. And we'll ****** do you". I believe the phrase in return is ... no we wouldn't stoop to that.

OCEAN WAVES AWAY

Ocean employees, or ex-employees have also been on the phone. It appears that the leisure software giant has been forced to lay-off nearly a third of its staff.

Golden Moments

A look back into the history of computing with *Express*. If it happened we reported it first.

ONE YEAR AGO

● The captain of many games players' hearts, *Kick Off 2*, was launched to coincide with the World Cup finals. Published by the UK firm Anco, it is still a well-loved game. It came in seventh in Amiga Power's recent league of all-time Amiga favourites.

● No doubt *Express*'s Dr Clare Anthony would enjoy a session with computer artist Ralph Steadman, who produced *The Computer's Dream*, a 30-frame story about the love of a male computer operator and his female computer. Just as in life, there was trouble, this time in the form of a viral (or should that be vile?) temptress. This imaginative, if questionable, piece of work was auctioned off in aid of Save The Children.

TWO YEARS AGO

● Hands up those who thought 486 PCs were new? Apricot produced the first one some two years ago. The VXFT server was a tower computer for controlling Unix-based systems. At £22,000, it was about three times the price of a similar system today.

● Talking about the vulnerability of totalitarian states to microchip technology, former US president Ronald Reagan said, "The biggest of big brothers is increasingly helpless against communications technology. Information is the oxygen of the new age." This presumably explains his generous policy on the export of said technology to the Eastern bloc.

● On the subject of computer-aided freedom, two hackers claimed to have used their dearly-bought knowledge to create a virus and introduce it into Scottish computer systems to bring about the fall of the Poll Tax. Described by its inventors as an antibody rather than a virus, we can only wonder if it somehow found its way into the heads of certain members of the Tory party.

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BUSINESS B03

BIPLANE This spreadsheet comes in either DA or application . Contains 32 built in formulae. This spredsheet can have a 1000 rows by 1000 columns. It also writes SYLK format for an easy file exchange.
SHORTCUT MACROS This excel macro gives the user key commands for often used menu commands such as Alignment, Border, Style and much more.
PRINT MACROS This us another macro for Excel which allows printing of up to seven ranges with a lot less hassle.
MULTIPLANE TEMPLATES A set of templates for Multiplan.
POWERPAGE This spreadsheet application gives a new look to the old familiar. For those wishing to get into the spreadsheet, there is a scripting language available.
XYZ CHART XYZ Chart is a program which creates 3D charts on your Macintosh. Selecting various menu options and actions, clicking on the chart, window or around the border will change the style, the size, the chart type and the position.

GAMES G03

GOLF Popular version of solitaire.
HEARTS Another Popular card game.
KING ALBERT Another clone of Solitaire, variation on Klondike.
KLONDIKE The all time classic Solitaire
MAC SEVEN Stategy card game
DECK EDIT Customise the graphics on the cards. Only works with certain card games.
TRICK TRACK A dice game played in some pubs.
PLUS: Ax Headroom, Automata, Pyramid, High Roller, Mouse Craps, Loto & Bill's Casino

MAC STACK 11

Three wordless story stacks by Amanda Goodenough. Inigo gets out, Inigo takes a bath and Your Faithful Camel. Ideally suited for young children. Fun to use.

MAC STACK 14

APPOINTMENT MASTER appointment book stack
PRINT FILES Works in conjunction with the standard hypercard address stack and lets you print mailing labels etc.
ADDRESS-O-MATIC A modified version of the address stack with more features.
MAKE LETTER BUTTON Paste this button into the address stack, to merge address with wp document.
KNOW IT ALL This one has it all, a monthly calendar, appointment book, reminder list, expense notebook etc.
QUICK INDEX ADDRESS STACK An improved version of the hypercard address stack.
MONTH A handy monthly calendar.
BUSINESS PHONEBOOK Yet another version of the Apple address stack.
FROG PHONE BOOK Another address stack
EXECUTIVE LIFE DEMO Demonstration of executive life. A stack with many useful features for the busy executive.
Quicknotes - a handy note card stack, create notes for any reason.

GAMES G08

AMAZING 23K Computer generated mazes to solve. The puzzles go from easy to nasty.
AMPS 3.0 This game is just like the old main frame game called Darleks.
ARTILLERY Vr 1.3 This is a siege game with good sound and graphics.
ASHES An unusual version of missile command.
ASTEROIDS A keyboard based version of the old arcade classic.
BANZAI Destroy the approaching enemy before they get you.
BRICKLES 8.0 A harder version of the game breakout.
CAIRO SHOOTOUT Computer version of fairground duck shoot - Egyptian style.
CANNON FODDER Another siege game, lots of options and good graphics.
CENTIPEDE This is just like the arcade game.
BASH BIG BLUE Ever had the urge to smash an IBM - Now's your chance!

GAMES G05

SWAMPWITCH Save your parents and yourself from the Swampwitch and her evil minions. This game is a 2 disk set and both Disks are required for the game. The sound and graphics for this game are exceptionally good for a shareware game. A hard disk is recommended for this gameas it is extremely large.

GRAPHICS GR09

3D EDIT This package is just short of outstanding. It is very comprehensive and is very easy to use. It has two sample drawings with it and you are able to produce quite complex drawings.
FREE 3D This is another 3D package that is easier to use than 3D EDIT. It also has the ability to shade objects as well as produce quite complex shapes. Good for ceramic artists
3D MOLES This program is able to show certain molecules, using animation. It rotates them in 3D.
DESKTOPS Create mathematical drawings.
SHOW Slide show program to display MacPaint files

COMMS C01

RED RYDER
This is the best communications program all round, it is also the most popular program of its kind for the Macintosh. All other communication programs are measured up against this one. Use it to call up other Bulletin Board Systems or call Compuserve etc... You can connect to almost any other computer.

GAMES G01

CHINESE PUZZLE An unusual but addictive version of the card game solitaire.
CORE WARS A hacker game, create the most vicious combat program.
CROSS MASTER This program generates crosswords.
CROSSWORD This is an excellent puzzle game
CRYPTOSOLVE 93 different puzzles to decrypt - quite addictive.

MAC STACK 22

MATH FLASHCARDS Flash cards for addition, subtration, multiplication and division.
MATHVENTURE Progress through the jungle, Requires Macintalk.
MONEY Quizzes children on money.
OLLIES NEW MATH Ollie the owl drills children in Addition, Subtration, Multiplication & Division.
PLOTIT Enter X & Y data to be plotted on a graph.
RIGHT TRIANGLE Calculate the unknown properties of a right angle triangle.
HEATHERS NOTES Teaches notes on the keyboard, using pre-recorded notes, voices and musical sounds.

BUSINESS B01

BIPLANE This spreadsheet comes in either DA or application . Contains 32 built in formulae.
MOCKPACKAGE 4.3.4 This is a set of four DAs, MockWrite, MockPrinter, MockChart & MockTerminal.
ROLO/BLACK BOOK/ADDRESS/TODO Various useful DAs
SCREENLOCK DA Asks for Password and then it blanks the screen, Wont reactivate the screen until the same password is entered
MACPROTECT Password protects applications, for use in unsecure environments.
SYSPWD Startup password protection program for use with Hard disks.
FLINTLOCK Similar to SYSPWD.
dCAD A good financial calculator.
PAINTSHOW Reads lists of MacPaint files and shows them in slide show fashion.
MACBILLBOARD Print billboard sized pictures using a standard printer, Good giant jigsaw maker.
BANNER Print a large simple text message on an imagewriter printer.

EDUCATION E01

BRAIN BUSTERS Maths games for kids.
GRADE Teacher gradebook program.
GRAVITATION 2 dimensional orbital simulation.
MACGRAPH Outstanding mathmatical function graphing program.
MECHANICS 5 Small graphics programs that illustrate various principles of physics.
MONSTER MATH Add up numbers and evade the monsters.
OYSTER Demo system that enambles you to create your own tutorials
TINY TAFEL Geneology program that will help you get back to your roots.
TOOLS FOR WRITERS The only shareware version we have seen. With it you are able to check your writing for vague words.

EDUCATION E02

GEOLOGY Various graphic programs that can be used for picture aids in geology classes. Requires MacPaint or Superpaint.
ADD Basic math tutor.
HELOMAT Fly the helicopter through the obstacles and shoot the problem that matches the answer.
MATH DRILL Drills you in basic math.
MATH MOUNTAIN Answer the maths questions to get the mountain climber up the mountain.
MATH MUD Give the correct answer to keep the boy from falling in the mud.
MATHMASTER 2 Designed to help teach algebra students many of the basics for first year algebra
MATH TUTOR Teach students various types of simple maths.

PROGRAM P01

DATAFLOW A Mac Flow Charter. Debug programs before coding them.
DIALOG CREATOR Make your own dialog boxes and then move them using Resedit or similar.
DISARM Diassemble 68000 resource code.
EDIT 2.1 A text editor for programmers. Suto indent, search and replace, time stamping and more.
LAYOUT Customise your finder. Change icon spacing, default fonts, and more. Be very careful this package is very powerful.

MAC STACK 19

SOUND MACHINE A large collection of sounds already in the database, which can be called on by using the mouse to click on the sound you wish to hear, plus a handy place for cataloging your own sounds.
SOUND MANAGER Lets you move sounds from one program to another program. Converts formats of sound.
SOUNDCAP MOVER Converts between soundcap format and hypercard format.
TALKTOOLS Shows how the Macintosh speech can enhance your stacks .

Please understand that most of the programs in this collection are shareware. This means that if after a set amount of time you are still using the programs then you should register the programs with the Authors.

Shareware programs require seperate payments to the Authors.

MAC STACK 4

NAME THAT PLANE quiz yourself on certain plane shapes.
AIRPORT Maintain a list of Airports, VORs and plan flights, very good for the amateur.
FLIGHT CHECK DEMO A demo version of a powerful stack that aids the amateur pilot. Helps you calculate the wieght and balance.
SHUTTLE INFO 1.0 A very well done stack that gives you a guided tour of most areas of the shuttle and a history of its flights. Full information and a collection of nice digitised pictures make this stack a worthy addition to anyones collection.

ALSO INCLUDED : Flights Plane and Oct 87 Manifest (Another Shuttle Stack)

DA's DA01

AIRPORTS Calculate distances between airports.
STARGAZER Shows the night sky for todays date.
PLANETS Shows the planets visible on todays date.
3D TIC TAC TOE Play against the computer on four levels at once.
PLUS: Calculators, Text editors, Screen savers, Tunes, comms, and a selection of novelty DA's too numerous to mention.

DA's DA02

FINDVALUES Perform quick calculations of stock and real estate.
FIND FILE Can't quite remember where that file is, Just enter a few letters and this DA will find it for you.
MESSAGE An electronic message board.
SAVIOUR Saves your files for you.
ALSO INCLUDED: 3 Clocks, Doodle pad, Hexpage, Mcsink, Concorde, Deskzap, Devtools, Phone Book, Terminal, Windows, World Time and many more.

UTILITIES UT01

DISK DUP + A single and double sided disk sector duplication program, which works with the MAC 512k and plus. This program is very handy if you require lots of copies of a disk or if you just require copies, as it formats the copies and verifies the disk. Has some good facilities and safty measures
MASS INIT A simple mass formatting program, with disk name and error handling facilities.
SUPERCOPY A useful copy utility which will duplicate most protected software.

This disk also includes numerous other programs which deal with copying, formating, testing, performance, recovery, verification and DAs.

MAC STACK 17

lots of digitised sounds from the comedy series Monty Python's Flying Circus. These sounds are of some of the best moments.

PROGRAM P02

SESAME C This is a powerful development systewm that includes a C compiler and it's own 68000 assembler. Compiles quickly and automatically saves assembly code to disk, this compiler has been tested and works well with all source code provided.
NOVASOFT EDITOR. This C editor comes with it's own source code.
ALSO INCLUDED Obi. Sort, Simple Tools, and a DA which will display the first 128 characters of any selected font in Decimal, Octal and hex.

GAMES G06

STUNT COPTER Drop the stuntman into the hay wagon from the helicopter
TORPEDOES Sink passing ships with your torpedoes.
TRON CYCLES Try to block your enermies cycles before he blocks you.
UTAAN ATTACK Destroy the ships before they reach the bottom of the screen.
WIZARDS FIRE Three games in one! Breakout, Pressure and Wizards fire (just like Missle Command.)
ZERO GRAVITY Keep your man in the middle of the zero gravity to get the lowest score.

GRAPHICS GR10

STARTUP SCREENS Are you sick of the normal startup screen, then why not get this disk. All you do is put one of the startup-screens into the system folder and when you startup you will be greeted by this screen instead of the WELCOME TO MACINTOSH screen. Screens include the Batman logos and pictures, plus many more.

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EXPRESS ON-LINE

The *Express* guide to computing at the grass roots level this week featuring Bulletin Boards G to Z

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NEW ARRIVALS ON-LINE

FANZINES

PDNR – PD enthusiasts, send an SAE to me for information on a special fanzine. James Thoroughgood, 114 Sandringham Way, Frimley, Surrey GU16 5YF

SCANNER – Amiga disk magazine. Packed with games/demos/utils/reviews/competitions plus much more. Send SAE for details to Telescan, Handsworth Road, Blackpool FY1 2RF.

ATARI LYNX NEWSLETTER – Free for reviews and news. Send SAE to Andrew Reid, 63 Crofway, Selby, North Yorkshire YO8 9DD. Please write and support.

STYLE – Free Atari PD newsletter. Published monthly bu Jennix PD. For your copy send a SAE to STyle, Jennix PD, 66 Abbey Road, Strood, Kent.

CHESS COMPUTER WORLD – Independent newsletter with results and ratings from the world of Computer chess. Subscription only. £3.50 a year for four issues. Write to Bryan Whitby, 16 Mansefield Road, Kingsley, Warrington, Cheshire, WA6 8BZ.

GENERAL AMIGA – The monthly disk-based magazine. Covering all areas of Amiga computing. Compiled by enthusiasts for enthusiasts. Only £1.50 per issue. Send to: General Amiga, 19 Earn Court, Alloa, Clacks, FK40 1PT.

ST GAMES NEWSLETTER – Games, reviews, previews etc for Atari ST. Send SAE for Newsletter to Ben Dobson, 1 Ryedale Way, Selby YO8 9BP.

USER GROUPS

CLUB A3000 – The largest Archimedes User Group in LOndon! Visit our second open day on Sunday 23 June. For more details please contact us on 081-445 2126.

LYNX LINK – Cards bought and sold and exchanged. Lynx fanzine each month. Send SAE to Peter Terry, 32 Boma Road, Trentham, Stoke, Staffordshire, ST4 8EB.

EUG – The Acorn Electron User Group. "The ELK is not dead yet!" Send large SAE for details to EUG 134 Great Knightleys, Basildon, Essex ss15 5HQ.

EURO-PALS – Contact service. Make computer friends anywhere and everywhere. Send £4 to Julian Ross, 2 Bysouth Close, Clayhall, Ilford, Essex IG5 0XN.

MUG USER GROUP – If you either play or run a multi-user game then write with details to the MUG User Group, 4 Garden Close, Penrith, Cumbria, CA11 7UD.

THE WOOLOOMOOLOO CLUB – If you like Jean-Michelle Jarre then join the club. Write to Bryan McPhail, 14 Wentworth Square, Kilwinning, Ayrshire, Scotland KA13 6RQ. Please state NCE 131.2.

DESKPRESS USER GROUP – Is there one? Fancy starting one? If your answer is yes to either of the above, please write to me, Raymond Day, at 3 Hall Terrace, Willington, Crook, Co Durham, DL15 0QN.

BULLETIN BOARDS

CONNECTIONS – On-line 24 hours. V21/V23/V22/V22bis. On-line games, gateways to other bulletin boards. Over 400 downloads for the BBC micros, 081-903 1309. Hack area, CUGS etc.

FOURTH DIMENSION – Support for all Sinclair machines, international QL/Spectrum Echomail system runs on QL. Speeds V21/V22/V22bis/V23. Hours: 2100 to1800 everyday. Tel 0202 600305 (Poole).

CHICHESTER BBS is now on-line. Up to 2400bps, 100Mb storage! 24 hours! The sysop who never sleeps... (sorry Braneloc). IMB, CPC, DWL areas, on-line games, World news in computing, electronic magazine. Chichester can only get bigger. Tel 021-770 6937.

PD LIBRARIES

PC-PD SHAREWARE – All disks £1.50. Postage £1 per order to PC-PD, GMC Computers, The Green, Cavendish, Suffolk, CO10. Tel 0787 280 526. Credit cards accepted.

ANDRIKKOS PC LIBRARY – PC shareware from £1 per disk. Hundreds of quality programs to chose from. SAE for list to Andy Kyriacou, 17 Patkhurst Road, LOndon N22 4JQ.

ARCH ANGEL PD – Over 230 Disks of Archimedes software. Send 75p for catalogue/demo disk to 9 Chancel Court, Pinhoe, Exeter, EX4 8QE.

FREAKS PUBLIC DOMAIN LIBRARY – Disks filled with programs of your choice from a huge range. Ribbons re-inked, recycled packaging, send stamp for catalogue to Freaks, 29 Leap Valley Crescent, Downend, Bristo; BS16 6TQ.

XT SHAREWARE for sale or swap from £1 for 5.25 inch and £1.20 for 3.5 inch disks. SAE for list to Kowalik, 24 West Chilton, Ferryhill, Co Durham DL17 0HH.

LAZER PD – Amiga PD from 35p. Send SAE for list or disk or catalogue disk to 57, Adamthwaite Drive, Blythe Bridge, ST11 9HL.

DANTILON DESIGN PD – Commodore 64 PD including demos, music and utilities. Send SAE for catalogue to RMS, 116 Taggart Avenue, Liverpool L16 9JA.

JENNIX PD – Forget the rest, we are the best. Over 400 ST/E titles (and growing every day). Send 50p (Cheques payable to NS KLee) to: Jennix PD, 66 Abbey Road, Strood, Kent ME2 3QB.

THE ULTIMATE PD DISK – Probably the only ST utilities disk you will ever need. Send £3, SAE to Alan Starey, 56 Cowland Avenue, Enfield, Middlesex, EN3 7DX

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Gaslamp	0706 358331	V21/22/22b/23
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Good Life	081-541 0187	Hst
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Grenadier	0825 762803	V21/22/22b
Guersey Island	0481 48393	300/1200/2400
Hacker's Delight	0702 523853	V21/22/23
Halfwits BBS	0272 340310	V22/22b
Hamnet	0482 465150	V21
Harlequin	061-945 3612	V21/22/22b/23
Hastings BBS	0424 717919	V21/22/22b/23
Hawk's Castle	0344 411621	Hst
Hawk's Realm	081-863 8751	300-2400
Hazzard Bb	071-737 0505	V21/22/22b/23
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Heartbeat	0734 352032	
Hilary's Board	0277 233468	V21/23
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Humber Bridge	0482 850785	V21/22/23
Humberside East Coast Systems	0964 614524	300, 1200, 2400
Ichthus (trinity 3)	0734 461466	V21/22/22b/23
	0903 700771	V21/22/22b/23
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	071-226 1248	V21/22/22b/23
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Jersey Opus	0534 39389	V21/22/22b/23
Jocks Away!	031-225 5368	V21/22/22b/23
Jolly Fisherman	0754 67796	V21/22/22b/23
Jolly Roger	081-742 1640	V21/22/22b/23
Jusavo	0324 32414	V21/23
Just The Place	0705 258694	Hst
K-wood	0608 83458	Hst
Kernow Bb	0209 821670	V21/22/22b/23
Key-board	0908 668398	Hst
Kidlington BBS	0865 56703	V21/22/22b
Kirklees Opus	0484 665415	V21/22/22b/23
King Of The Castle	0233 620228	V21/22/23
Komputer Knidge	0844 274066	V21/22/22b/23
Kybernesis	081-673 7294	V21/22/22b/23
Labyrinth	051-724 4458	V21/23
Lamplight Qbbs	0705 811531	V21/22/22b/23
Laser Tbbs	0532 438430	V21/22/22b
Lau's Ql Bb	081-751 6096	V23v
Level 9	0926 889208	300-2400
Lightfinger's Place	0202 485723	V21/22/22b/23
Linelight	0580 212043	V23v
Linx BBS	0522 511277	V21/22/22b/23
Liquorice Allsorts	0633 279985	
Nova-net	0274 370760	V22
Liverpool Mailbox	051-428 8924	V21/22/22b/23
Liverpool Ros	051-931 4271	V21/22/23
Loch lomond	0389 55762	V22/v22bis
Loft	0442 230461	V21/22/22b/23
Logical BBS	0772 623167	300-2400
Log On In Tynedale	0434 606639	V21/22/22b/23
London BBS	081-455 6607	V21/22/22b/23
London City Mag	081-468 7648	V21/23/23v
London Connexion	081-667 1313	V21/22/22b/23
London Embassy	081-366 1778	Hst
London Guest Hse	081-748 0974	Hst/v32
London Mail Centre	081-534 1200	V21/22/22b/23
London Metropolis	081-519 1055	V21/22/22b/23
Loony Bin	0703 787489	V21/23
Mabbs	021-444 8972	V21/22/22b/23
Mach II BBS	0242 260 685	V21/22/22bis
Mactel Hq (grn Box)	0602 455444	V21/22/22b/23
Mactel Metro	081-543 8017	V21/22/22b/23
Mactel Phoenix	0473 610139	V21/22/22b/23
Madness BBS	0603 300947	V21/22/22b/23
Magic Castle BBS	021-430 3761	V21/22/22b/23
Magic Mushroom	0361 83641	V21/22/22b
Magnum	0274 547006	V21/22/22b/23
Magrathea	0376 24402	V23v
Manor	0980 863031	V21/22/22b/23
Marctel	081-346 7150	V21/23/23v
Matrix	051-255 0225	V21/22/22b/23

Max BBS V21/V22/V22bis/V24/V32/V42/V42bis/9600/14K4/MNP and LAPM. Numbers as follow:

0905 52536	Alien Node
0905 57822	We/ve Got A Hot One Here
0905 58030	Throbnet Node
0905 56610	So You Like Spam Node
0905 57112	Dirty Lines Node
0905 56335	Amiga Node
0905 58042	Troffers Node
0905 754151	For All Software Troffers
0905 754127	Live and Kicking Dawn Raid

Maximum	0905 429595	
Mbbs Leconfield	0964 550745	V21/22/22b/23
Mbbs Mitcham Ilc	081-648 0018	V21/23
Medway	0634 280031	V21/22/22b
Mektronic Consultants	061-773 7739	V21/22/22b/23
Merkinstead	061-434 7059	V21/22/22b/23
Merlin	0443 834179	V21/22/22b/23
MetNet Train System	0482 473871/442251/449028	V22bis/V23 and faster
Micro Live Bb	081-567 6500	V21
Micro Update	081-877 1529	V21/22/22b/23
Microdeal	0726 65422	V21/22/22b/23
Microlog	0422 71921	V21/22/22b/23
Midget Gem	0748 834836	V21/23
Mind Boggles	0362 762868	V21/22/22b/23
Miridian	0273 588924	up to 2400.
Mininet 3	0642 672813	V21/22/22b/23
Miracom Support	0473 232540	Hst
Mirage	061-652 1242	V21/22/22b/23
Mirror II	0628 810889	V21/22/22b/23
Mirrorworld/quest 1	0883 844044	V23
Mission Impossible	0602 654329	Hst
Mk Board	0908 671289	V21/22/22b/23
Mkbbs	0908 504556	V22/22b
Monkey Tree	0952 677002	V21/22/23
Monusci	0293 545665	V21/22/22b/23
Movie BBS	0703 650037	V21/V22/V22bis
Multi-bbs	041-649 9043	V21/22/22b/23
MWCFE	0926 421844	V22bis
My Little Phoney	0793 849044	V21/V22/V22bis/V32/HST
Network 23	0274 482021	V23v
Nicc Mid-west	0341 250377	V21/22/23
Nighthawk	0329 45384	300-2400
Nite Life	071-976 6807	V21/22/22b
No Escort Required	081-200 3817	Hst
No.1 BBS	081-958 1689	V21/22/22b
Noah BBS	0272 572322	300-2400
Norpac	0434 608324	V21/22/22b
North Wales BBS	0978 88372	V21/22/22b
North Yorks Q	0423 868065	V22/22b
Northern Lights	0768 773685	V22/22b
Norwich Onion BBS	0603 423305	V21/22/22b/23
Nova	0455 553371	V21/22/22bOdd-ball
081-679 2583	V21/22/22b/23	
Odyssey	0482 870919.	
On The Beach	0273 600996	V21/V22/V22bis/HST
Open Access	081-427 3974	
Optix	0482 872294	V21/22/22b/23
Organic Garden	081-464 3305	V21/22/22b/23
Out Of The Blue	081-668 7667	V21/22/23
Owl Service	0532 605876	V21/23
P'S & Q'S	051-236 3105	V21/22/22b/23
Pacific Lightning	0732 845338	V22/22b
Packet BBS	081-547 1479	V21/22/2
Packet Place	0484 435620	V21/22/22b
Palm Beach	0303 265979	V21/22/22b/23
Pazaz Viewdata	0383 620259	V23v
PC Access	071-608 0081	V21/22/22b/23
PC-Amiga Link	04023 84914	up to 2400
PC Forum	0322 335348	V21/22/22b/23
PC Link	0375 674046	V21/V22/V22bis/V32
PC Serve Shop	081-864 2633	V21/22/22b/23
PC Serve Softnet	0895 420164	V21/22/22b/23
PC Serve Storehouse	0494 728094	V21/22/22b/23
PC-VAX Opus	081-800-3549	V21/22/22b/23
Pcamiga BBS	0602 735119	V22/22b
Peacenet West	0895 448998	V23v
Pecan Software	0272 248076	V21/22/22b
Pegasus	0905 755085	300 -2400
Penguin	0943 830820	V21/22/22b/23
Phacs South West UK	0752 361291	V21/V22/V23/V22bis
Phantom	0226 340425	V21v/22v/23
Phoenix	0249 817704	Hst
Piston Popper	0424 853361	
Plug-ole	021-472 0256	V21/22/22b/23
Plus And Minus	0559 322766	V21/22/22b/23
Poacher	0476 62450	V21/22/22b/23
Polynet Bb	071-580 1690	V21/22/22b/23
Pook BBS	0268 767365	V21/22/22b/23
Port Of Call	081-391 5779	V21/22/22b/23
Power Play Q	0698 423669	V21/22/22b/23
Power Tower	0533 880114	V21/22/22b/23
Prestonet	0772 612462	V23v
Project BBS	0384 401770	V21/22/22b/23
Prometheus	081-300 7177	V23v
Proximity	0793 480028	V21/22/22b/23
Publishing Shop	091-261 5228	V21/22/22b/23
Purely Pc	0232 645942	V21/22/22b
Pyramid	071-239 0871	V21/22/22b
Pyroto Mountain	0895 59071	V21/22/22b
Quantum	021 707 0681	V21/V22V22bis
Quasar	0846 693067	V21/22/22b
Random Access	0282 817379	V21/V22/V22bis/9600/HST/V32
Really Interesting	0582 414991	
Reflex BBS	0703 685527	V21/22/22b/23

SPOTLIGHT ON JJ PD MUSIC SERVICES

JJ PD Music Services is a new Public Domain Library specialising in MIDI files for the ST.

At present it holds some 150 songs which are in file formats compatible with all the leading music software for the ST, including *Notator* and *Cubase*. They are set up ready to go with a Roland MT-32 or Roland D-110, which is becoming a standard for music libraries.

Most of the titles are rock'n'pop tunes including everything from classic Beatles tracks – *Help, Can't Buy Me Love* – and Elvis Presley, through to more up to date tunes such as Dire Strait's *Twisting By The Pool* and *The Walk of Life*, Erasure's *Stop* and Madonna's *Material Girl*.

To order a complete catalogue or disks call JJ PD on 027 874550. The library promises that all orders will be despatched on the day they are placed.

Regency BBS	0542 33050	V21/22/23
Remotelpcw	0555 851887	V21/22/22b/23
Rivendell	0602 640488	V21/22/22b/23
Rm Tech. Support	0865 796431	V21/22/22b/23
Road Runner	061-483 4105	V21/22/22b/23
Royalink Uk	0962 66807	V21/22/22b
SAC BBS	0242 260685	V21/22/23/22b
Sas BBS	0742 325232	V21/22/22b/23
Satellite Southwest	0392 53116	V21/22/22b/23
Scabbs	0909 479080	up to 2400
Scary Monster	0734 320297	Hst
The Schizophrenic Wolf	0772 456526	V21/V22/V22bis
Scot Air	0505 36036	V21/22/..2b/23
Scothelp-St	031-343 6368	V21/22/22b/23
Scottish Opus	041-880 7863	V21/22/22b/23
Scottish Wildcat	0674 671141	V21/22/22b/23
SCS One	0444 236002	V22b
Sector	0772 454328	V23v
Semaj Qbbs	0303 862415	V22/22b
Sentinel Bb	0628 781429	V21/22/22b/23
SES Databoard	0622 630240	V21/V22/V22bis
Shades	0342 810905	V23
Shadowfax	0252 528146	V21/22/23
Shadowland	081-897 0488	V21/23
Shasby's Lair	0772 561066	Hst
Sherwood Forest	0602 397113	V21/22/22b/23
Short Circuit	0273 462967	Hst
Sid (acorn Service)	0223 243642	V23v
Sigma Four	081 330 7738	
Signal Box	081-337 6583	V21/22/22b/23
Sin Bin	0532 661536	V23
Sirius	081-542 3772	V21/22/22b/23
Sirius II	0494 778425	V21/22/22b
Six And Five Eights	0273 688888	V22/V22bis
Skull	0379 740972	V22/V22bis
Skull's Tower	081-943 1194	V21/22/22b/23
Sky-line	0603 742273	V21/23/23v
Skyline 1	0234 741691	Hst
Softmatic BBS	0733 322540	V21/22/22
Software Madness	0895 72021	300 to 2400
Software Source	0892 661149	V22/22b
Sorcerer's Dungeon	0636 815705	
Sounds Of Mercia	0203 682896	V21/22/22b
South Lincs BBS	0780 63954	
Sparx	0793 480287	V21/22/22b/23
Sphere BBS	0294 221350	V21/22/23/22b
Spud's Xanadu	0203 686819	V21/V22, V23, V23b
Sputnik Spitfire	0501 31754	V21/22/22b
St London BBS	081-443 2432	V21/23
Stabb	0793 855176	V21/22/23/22b
Staines BBS	0784 465794	V21/22/22b/23
Starbase One	071-733 3992	V21/22/22b/23
Steve and Jackie	0703 650037	V21/V22/V22b/V23
Strange Brew!	081-665 5038	V22/22b
Style QBBS	0442 381164	300–14.4K (HST)
Stun User Network	061-429 9803	V21/22/22b/23
Summer Wine	0484 653234	Hst
Sunburn Inc.	021-449 5269	V21/23
Superbase User Group BBS	081 339 0096	300-14.4K/HST/V32
Super Ops BBS	0782 284081	V21/22/22b
System X	0904 612934	2400
TABBS	0533 517615	V21/22/23
Tabbs	0225 743797	V21/22/22b/23
Taecomm	0994 6709	V21/23
Taff's Retreat	0834 4562	V21/22/22b/23
Tardis	0772 27236	V21
Tasque	0355 222664	Hst
Tasug Opus	0904 760129	V21/22/22b/23
Tavern	081-445 6514	V21/22/22b/23
Tech net BBS	0633 216500	
Tequila Sunset	0703 867786	V23v
Terminal Net 5	0402 456135	V21/22/22b/23
Terminal-net	081-423 5262	V21/22/22b/23
Tharr BBS	0234 261804	V22/22b
Third Wave	071-585 3163	V21/23
Three Kings	0354 56267	V21/22/22b
Track 83	0953 851351	V21/22/22b/23
Transylvania	0274 621668	
Tranz-com BBS	081-952 6273	V21/23
Tug II	0905 775191	V21/22/22b/23
Twilight Zone	081-788 0884	V21/22/22b/23
Twilight Zone II	071-608 1485	Hst
Unisys Etoi BBS	081-453 5739	V21/22/22b/23
Unit One	0285 713688	V21/22/22b
VITAS	021-749 5860	V21/23
Valente'S BBS	071-978 2078	Hst
Vector System	0329 45824	Hst
Viking East Anglia	0255 503048	V23v
Village Fayre	081-841 5971	V23
Voyager BBS	061-725 9580	V21/22/22b/23
Wally's Board	0506 440582	V21/V22/V22bis/V23
West Norfolk	0553 761290	1200/2400
White Lightning	0635 37259	V22/22b
Whitehall Pent	071-930 3903	V21/22/22b/23
Wild Imaginings	091-263 4303	V21/22/22b/23
Winchester Remote	0962 69322	V21/22/22b/23
Wizard	0703 702427	
Wolverhampton ROS	0902 745337	V21/22/22b/23
Womble Base	081-979 9606	V23
Woodgreen BBS	081-889 5624	V21/23
Yugo BBS	0734 753648	V21/22/22b/23
Zeus BBS	0487 710487	V21/22

NEXT WEEK PD LIBRARIES

SHOPPING EXPRESS BUYERS' GUIDE

While *Shopping Express* is undoubtedly the perfect way to track down the best bargains in the computer world, many people are still wary of buying products via mail order or through personal ads. This is probably because usually you are not able to have a look at what you are purchasing before you hand over your money.

We do everything in our power at this end to make sure that all the advertisements we run are above board. But here are a few tips designed to help take the risk out of buying via mail order or over the telephone.

- Be precise in describing what you want to buy. Leave no room for error. Feel free to go overboard in double checking details – make, model, specifications, colour, size, the page number and name of the magazine in which you saw the advertisement etc.
- Confirm the exact price of the article you are buying. If you are phoning a company check if there are any hidden extras, such as postage and packaging.
- Check how the item will be delivered to you and how long it should take. This is especially important with reader ads where delivery details are rarely mentioned.
- If you are writing off for the product keep copies of all letters. If you are phoning, note down details of when you phoned and who you spoke to.
- If possible enquire about guarantees and servicing. Check the supplier's policy on returns and refunds. With reader ads, it is best to make the effort to see the item personally before you hand over money.
- When possible pay by credit card for items over £100, as this provides extra cover under the credit card companies' own insurance schemes. Otherwise use a crossed cheque or postal order. Avoid sending cash at all costs.

THE PD COLUMN

Are we on the verge of a New Age for the Public Domain? Frank O'Connor examines a scheme to get PD on the shop shelves nest to its commercial rivals

PD on the shelves of high street shops? Seems a bit unlikely? Well, perhaps it is not as far off as you might think.

New Age computing, an old hand in the Amiga PD scene, has taken a very great step forward and is now making moves on computer retailers. What it wants to do is place its disks on shopshelves, giving them a little more respectability and even more importantly making it more easily available.

Doing this is a bit of a logistical nightmare. Shop owners often don't know what the hell PD is and more frequently don't believe it will sell. The idea New Age will have to make retailers understand is that PD is a darn sight cheaper than the cheapest budget titles on 16-bit formats. However there is a drawback in this line of argument. Cynically speaking, the cheaper the title, the lower the shopkeeper's profit margin.

WHERE TO GO FOR PUBLIC DOMAIN

The lads at New Age computing can kit you out with Amiga stuff, so contact them at: New Age computing,187 Perrysfield Rd, Cheshunt, Herts, EN8 0TL or Tel 0992 465 366

The ST Club can be found at; 49 Stoney Street, Nottingham (not a long address, but that's the one they supplied)

PD AVAILABILITY

Besides needing to convince retailers of the worth of PD, New Age also aims to make its products more visible to the casual games player. The average gamer might never go anywhere except John Menzies or WH Smith for their software and they certainly won't come across any PD in major chains like these.

Usually, mail order companies are the only people who really supply software of this type and most of these companies are tiny businesses, often operating from home. This lack of availability and visibility mean that selling PD isn't as profitable as it might be.

PD is by its very nature a low profit business, but there is scope for some harmless profiteering. The price of a 3.5 inch disk to a domestic user is about £1. A PD firm could probably purchase half decent disks in bulk at about 17p each. Even with production and ancillary costs taken into account, there is still quite a healthy profit margin.

CAUTIONARY TALES AND HIGH SALES

Quite a few little companies are able to make a decent, though not extravagant living from PD. People can't resist a bargain, but they need to know of its existence. Full colour ads in national newspapers are obviously out of the question and so it is for some people an invisible, if not unobtainable service.

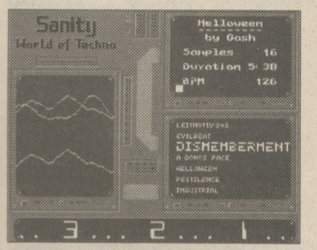
New Age is one of the first PD libraries to take positive steps towards selling PD on a more businesslike basis.

ONE GIANT STEP FOR PD...

Already the company has intorduced a couple of innovations to make its PD more attractive to retailers.

One of the things it has done is to package the disks in a sturdy plastic wallet along with reasonably informative backing cards. At least now the retailers they have already convinced can display the product along with full price software.

The price of the software should hopefully lead to large volumes of sales. The worst thing that can happen to the consumer is that they pay a few pence



• You might well find the latest demos from New Age on sale at your local computer shop.

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over the cost of a normal blank disk. If it's awful, you can simply re-format it and use it for something else.

BARGAIN BASEMENT?

Having seen some of the software that is currently doing the rounds, the lucky shopper could find themselves with an incredible bargain. PD games are often as good as their budget counterparts (sometimes better), utilities just aren't available at such a low price in any other form and demos aren't commercially available, period.

These are the areas where PD could be a force to be recognised. Demo creators and amateur programmers are such dreadful show-offs they would be only too happy to see their work in the shops. Big software houses might just sit up and take notice if PD companies were undercutting them on the shelves.

It's an interesting situation and one on which I'll be keeping a close eye in the coming weeks.

THE NEW TITLES

The first batch of titles from New Age consists mainly of sexy and impressive demos. New Age's policy on software selection is logical and watertight. It only releases good stuff. If only software houses were as choosy...

All feature excellent music and a lot of acid remixes, as well as some nice mellow tracks for the less energetic among us. The usual impressive animations and graphic sequences accompany the music; one track in particular is accompanied by a very groovy colour cycling routine. It resembles water, only in fluorescent colours and with oily patches...weird.

One non-demo package is a decent soundtracker module. This allows you to play back sound modules and fiddle about with them. Even more impressive is the fact that it comes with 24 sound modules on the disk, so you can listen at leisure to a very large selection of tunes.

Neat, but it does highlight one PD problem. There are no instructions! Still, the program is reasonably self explanatory and even I work out how to use it, so it can't be that difficult! ■

LOOK OUT FOR THESE ON COMPUTER SHOP SHELVES

The following titles are among the first batch of packaged PD from New Age:

SUBSTANCE – mainly music demo with some really outstanding samples and well orchestrated tunes.

NOISEPLAYER 4 – excellent and simple to use modular music assembly package. Use the music tracks included, or create your own.

TOTAL CONFUSION – More acid influenced tunes backed up by impressive graphical tricks.

PULLING THE TRIGGER – Believe it or not, this disk is packed full of music and graphics.

WORLD OF TECHNO – Brilliant music, sadly let down byt a lack of decent visual entertainment – the equivalent of five or six twelve inch singles for only a couple of quid.

COMPUTER LYNX MAGAZINE – Up to the minute Amiga news, with working applications software, music and even games and all on one disk.

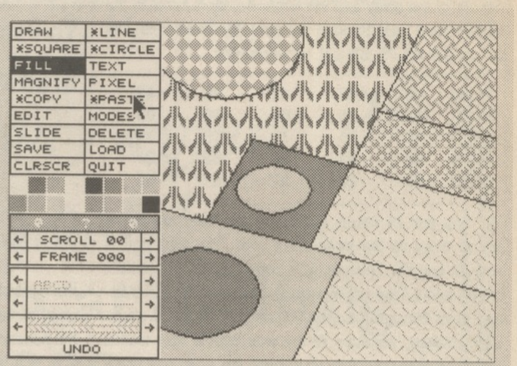
ST ART ATTACK

ST Art **from the ST Club in Nottingham, is a rather groovy colour art program. It includes regular brush, fill and pattern features, but is helped by a very neat cut and paste option. This is sometimes absent from public domain art packages and so it's nice to see it implemented so well and for nowt.**

The program is very simple to use. The scroll function is very handy indeed, allowing you to centre anything you need to magnify before you begin.

There is a large range of fill patterns included in the package as well as shape definers. Circles are in particular a joy to create and easy to duplicate.

All in all a very slick and polished piece of software but I don't think that *DeluxePaint* has too much to worry about yet..



• ***DeluxePaint it ain't, but then it does cost around £50 less. For a piece of software that costs next to nothing ST Art offers some really very impressive features, especially if drawing circles is your thing.***

NRG PD

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ND112 ADDAMS FAMILY DEMO
ND113 AMOS CREATOR II DEMO
ND114 BATMAN Brill movie sequence
ND115 BUDBRAIN DEMO (2 disks)
ND116 BUDBRAIN 2 Madonna murderer!
ND117 COMIC STRIP PRESENTS...
ND118 CAR & UNICYCLE Brill anim
ND119 ENTERPRISE LEAVING DOCK!
ND120 EVIL DEAD DEMO Creepy Stuff!
ND121 EDUCATION OF COOL COUGAR
ND122 FLINTSTONES Yabba dabba do!
ND123 FRAXION FUTURE VISIONS
ND124 FRACTAL FLIGHT (1 MEG)
ND125 FILLIT THE FISH DEMO
ND126 GARFIELD DEMO Cool Cat!
ND127 IRAQ DEMO (1 MEG) Great!
ND128 KYLIE DEMO (2 DISKS) COR!
ND129 KYLIE LOCOMOTION Yummy!
ND130 LAUREL & HARDY (2 DISKS)
ND131 MADONNA CARTOON
ND132 MADONNA DEMO 2 (2 DISKS)
ND133 MONTY PYTHON (2 DISKS)
ND134 NEIGHBOURS Hilarious Pics!
ND135 NOT 9'OCLOCK NEWS (2 DISKS)
ND136 POPEYE MEETS THE BEACH BOYS
ND146 PHENOMENA ENIGMA (1 MEG) EPIC
ND137 ROBOCOP DEMO 40s to comply!
ND138 SPACECHASE ANIMATION (1 MEG)
ND139 SPACE FIGHTER (1 MEG)
ND140 STAR TREK ANIMATIONS 17
ND141 SCULPT 3D ANIM'S inc Newton
ND145 SIMPSONS DEMO (1 MEG) Brill!
ND142 TEENAGE MUTANT TURTLES!
ND143 TOTAL RECALL Mars Mania!
ND144 VIZ SLIDESHOW Fat Slags etc

MUSIC
NM151 AMAZING TUNES 2 (3 DISKS 1 MEG)
NM152 BETTY BOO Terrific Tunes!
NM153 DIGITAL CONCERT 2
NM154 DIGITAL CONCERT 3
NM155 DIGITAL CONCERT 4 Leila K etc
NM156 DIGITAL CONCERT 5 The Power..
NM157 DIGITAL CONCERT 6 House Music
NM158 D-MOB MUSIC 4 (2 DISKS)
NM159 GAMES MUSIC CREATOR
NM160 GROOVE IS IN THE HEART!
NM161 GENESIS Phil & the rest!
NM162 HUMAN LEAGUE
NM163 IRON MAIDEN Rock! Rock! Rock!
NM164 MADONNA VOGUE (4 DISKS)
NM165 MADONNA HANKY PANKY!
NM166 MICHAEL JACKSON BAD! AAWW!
NM167 MIAMI VICE REMIX hot stuff!
NM168 PET SHOP BOYS hi NRG!
NM169 PINK FLOYD THE WALL Classic!
NM170 QUEEN: FLASH (2 DISKS)
NM171 TECHNOTRONIC MEGAMIX
NM172 VAN GELIS DEMO (1 MEG)

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NU181 BIORHYTHMS Emotions monitor
NU182 INTROMAKER Create demos!
NU183 ICONMANIA Icon utility
NU184 TV GRAFFIX (2 DISKS) Fonts
NU187 MASTER VIRUS KILLER V2.1
NU185 NOISETRACKER 2.0 MIDI
NU186 FUTURE COMPOSER Make music!

GAMES
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NG192 ARCADE GAMES Tons of fun!
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NG196 BLIZZARD Shoot em up!
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NG200 GRAVATTACK
NG201 JEOPARD (1 MEG)
NG202 JUMPY Arcade Fun
NG203 MONOPOLY Brill classic!
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DATA DAY SORTING

You've got a lot of data to store, but it must be easily accessible. Mary Branscombe shows you the best way to sort yourself out.

If you have a lot of data to store then an array is often the best way to store it because you can save and retrieve information quickly. If you want to sort the contents of an array into order, the procedure is slightly different from the straightforward comparison we used last week, but you could still adapt all of these algorithms for lists if that's how you're storing your data.

BUBBLE SORT

The bubble sort works in a very similar way to the sorting we did by comparing all the numbers in turn, but it's a little more efficient. Starting at one end of the array, compare each pair of values that you come to. If the values are not in order, switch them. Smaller values will be switched upwards each time and larger numbers downwards. This means that smaller numbers 'float' to the top of the array and the larger numbers 'sink' to the bottom. One pass through the array M, which holds the values [60, 42, 75, 83, 27], looks like this:

M [1]	60	42	42	42	42
M [2]	42	60	60	60	60
M [3]	75	75	75	75	75
M [4]	83	83	83	83	27
M [5]	27	27	27	27	83

The first pair of values is 60 and 42. They are in the wrong order so we swap them over. The next pair is now 60 and 75. This pair is in order, as are 75 and 83, but 83 and 27 are not in order, so we swap these. After one pass through the array M, only 27 is out of place. Unfortunately, because of the way bubble sort works, 27 will have to percolate up through the array one place at a time. Only one pair of numbers will be out of order in each pass and only one exchange will be made.

After the fourth pass the array is sorted, but the computer can only find this out by doing another pass where it doesn't have to make any changes. The code uses a Boolean flag NoChange to check for this. If any values are exchanged, the program sets this flag to false. If we look at the array after each pass it looks like this; the shaded numbers are sorted:

M [1]	42	42	42	27	27
M [2]	60	60	27	42	42
M [3]	75	27	60	60	60
M [4]	27	75	75	75	75
M [5]	83	83	83	83	83
	after first pass	after 2nd pass	after 3rd pass	after 4th pass	after 5th pass

The algorithm looks like this:

```
repeat
    Set NoChange to True
    for each pair of adjacent values do
    if the values are out of order then
        begin
        switch the values
        Set NoChange to False
        end
until the array is sorted
```

In the `for` loop that looks at the pairs of numbers, the control variable `First` is also the position in the array of the first number in the pair, so that `First+1` is the position of the second number in the pair.

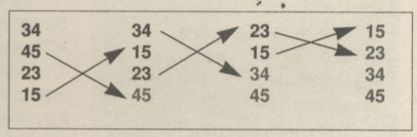
You have to check that `First` is always less than the number of values in the array or `First+1` will be too large. The initial value of `First` will always be 1. If the array holds `N` elements, then the final value of `First` can be `N - Pass`, where `Pass` is the number of times you have been through the array. This works because large numbers are pushed all the way to the bottom of the array because we are looking at the values from top to bottom. This means that there is no need to look at the last element after the first pass or the last two elements after the second pass and so on. As you can see from the pictures, they are already sorted by then.

GOOD FOR – When the array is nearly sorted already.When the array is small.

BAD FOR – If the array is in reverse order

SELECTION SORT

In a selection sort, you pick out the largest number that you can find in the array each time and put it at the end of the array. The number that was at the end of the array before goes wherever the largest number was before. As you put each number to the bottom, you freeze that section and only look at the part you haven't sorted yet so there's less to sort each time. The pictures show how this works for an array of four numbers, [15,34,45,23]. Each time, the largest number moves to the end of the array. The actual algorithm looks like this.



START THE LOOP

Look through the unsorted part of the array; find the largest number in the unsorted array; save the position of the largest number X; start another loop; look through the rest of the array; if a number is larger than X save it as the largest number; end second loop; switch X with the number at the end of the array; end first loop

The code to switch the two values into order is the same Switch procedure used in the bubble sort code. Because we look at a smaller part of the array every time, this is more efficient than a bubble sort.

GOOD FOR – Small to medium arrays. Arrays that are very out of order. Arrays that are easy to index

BAD FOR – Large arrays.

The code for these sorting routines is in Pascal so that we can use the downto command, which decreases the variable that controls how many times you go around the loop. How could you do it in another language? Change the value of ArrayLength to deal with arrays of different length. The type declarations will be part of the main program that calls the sort procedures. ■

COMPARING PAIRS HELPS ORGANISE YOUR CODE IN BUBBLE SORT

```
type
   TestArray = array [1..5] of Integer;

procedure BubbleSort (var Array : TestArray;
  ArrayLength : Integer);
var
  NoChange: Boolean;
  First, Pass : Integer;

procedure Switch (var Record1, Record2 :
Integer);
{switches the contents of two variables,
Record1 and Record2}
var
  Temp : Integer;
begin {Switch}
  Temp := Record1; Record1 := Record2;
Record2 := Temp
end {Switch}
```

```
begin {BubbleSort}
Pass := 1   {First pass}
repeat
  NoChange := True;
  for First := 1 To ArrayLength - Pass do
          if  Array[First]  >  Array[First+1]
then
          begin {switch values}
          Switch(Array[First],
Array[First+1]);
          NoChange := False
          end {switch values}
  Pass :=m Pass+1
until NoChange
end {BubbleSort}
```

Selection sort

```
type
     TestArray = array [1..ArrayLength] of
Integer;
```

```
procedure SelectSort (var Array : TestArray);

var
   i,j,Index: Integer;

begin {SelectSort}
  with Array do
  {order numbers}
  for i := ArrayLength downto 2 do
  begin {Find highest number}
          Index := i;
          for j := i-1 downto 1 do
          if Array[j] > Array[Index] then
                  Index := j;
          if Index <> i then
                  Switch          (Array[i],
Array[Index])
  end {Find highest number}
end {SelectSort}
```

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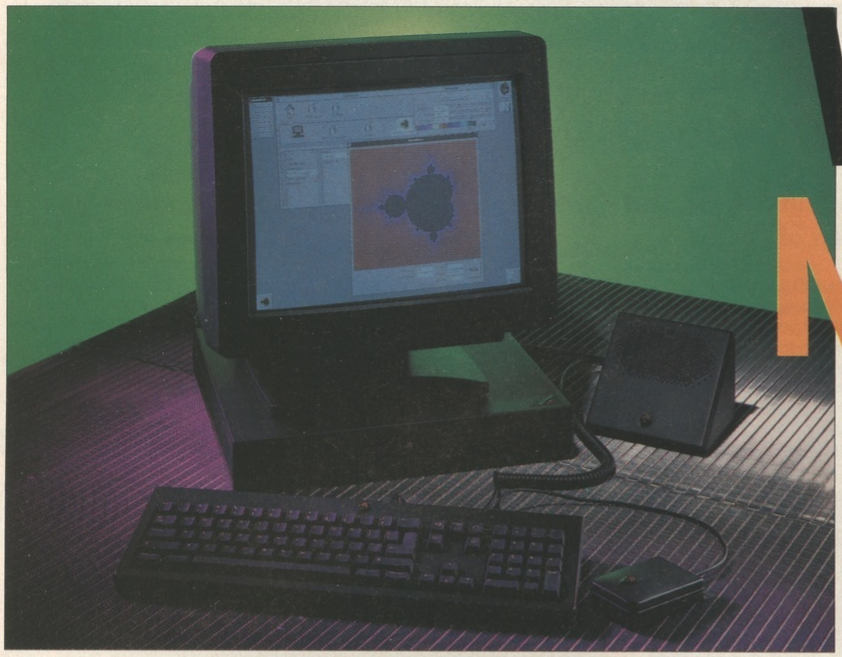


WHAT NeXT?

The NeXT machine promises to be the Lamborghini of personal computing. Keith Pomfret fired it up to see if Steve Job's baby is the sexiest machine ever.

PRODUCT: NeXTstation
FROM: NeXT
CONTACT: 081-565 0005

A year or so ago, industry rumours materialised into fact when Steve Jobs, the man who invented the Apple Macintosh, unveiled NeXT.

It's a fully multi-tasking machine capable of running the UNIX operating system so beloved by Workstation users. However, it has a user-friendly front end which is intuitive enough for a complete beginner to get the hang of straight away, while powerful enough to offer instant productivity to the more experienced user.

Several programs are now ready and more are imminent. The promise of another Steve Jobs success looks closer with a userbase of some 8000 machines already established with order books picking up as the software becomes available.

There are four models in the range, two mono and two colour. The review machine was a colour NeXT station with a 400Mb hard drive, 16Mb of memory and a 2.88Mb floppy. drive. As well as a standard set of utilities, it was supplied with demo programs and commercial applications from Lotus, WordPerfect and NextStep. Now that the heavyweight software companies have decided to develop for NeXT, the trickle of software should become a stream.

DESIGN FOR THE FUTURE

NeXT is available in any colour as long as it is black, but already it is winning converts on design alone, looking good at home or in the office. Part of the ethos of NeXT is to offer power and productivity for the least amount of effort. Installing a new power PC or Workstation can be a nightmare of electric spaghetti and service calls. With the NeXT, this trauma vanishes. Open the box, take out the NeXT, follow half a dozen simple instructions and switch on.

The NeXT fires up into a business-like graphic interface that seems to have all the good points of other WIMPs without any of their weaknesses. It is a pleasant 'shades of grey' Workspace that's easy on the eye. Locating and running programs from this multi-tasking environment was simple and it is a credit to NeXT that the first sessions with the machine were managed without reference to the manuals or tutorials.

Another innovative feature of the NeXT is on-screen PostScript emulation. This means that DTP programs will look similar on screen to the printed output. No more jagged letters and printouts that don't look like the display. The mouse gave definite and precise control and the buttons were positive, but a. raised NeXT logo on top does nothing to improve comfort.

POWER APPLICATIONS

We waited for commercial applications to be available before our NeXT test so we'd be testing a working machine instead of a collection of demos. The applications supplied ready-installed were *WordPerfect, Lotus Improv* and *Lotus Presentation Builder.*

Also included were the Webster digital dictionary, and various library, sound and input/output utilities. We wanted to test software installation as well so the DTP package *FrameMaker* was supplied on disks. We were concerned about the lack of documentation supplied with them but in the event there was no need to worry. The first disk was placed in the NeXT's 2.88Mb floppy drive and we clicked on the install icon. Other than placing the remaining three installation disks in the drive as prompted, the complex installation was totally hidden.

With *FrameMaker* installed, we clicked on the Workspace icon and the program loaded. As NeXT is multi-tasking, we clicked on a few more icons to see what NeXT could do. *WordPerfect, Improv* and *Presentation Manager* loaded up without any problem and we were able to hop from application to application, typing a document, importing text into DTP, running up a column of figures in the *Improv* Spreadsheet and pausing to try *Presentation Manager.*

The utilities and demos on the NeXT made a total of forty or so executable programs so we decided to stretch multi-tasking to the limit and see how many the NeXT would let us open before it gave up. We ran out of programs before the NeXT ran out of steam.

An important consideration when running a multi-tasking system is that data can be transferred between applications that are running simultaneously. This can only be achieved if a machine has a strictly enforced set of guidelines for programming, development and use. The NeXT has these and applications that stay within the guidelines can be run as partners, with the transfer of data handled transparently by the operating system.

The quality of the applications we tried was good with features moulded to the NeXT operating system in a way that complimented both program and machine. ■

THE TOP NOTCH COLOUR NeXT STATION SPECIFICATIONS

CENTRAL PROCESSOR 25MHz 68040
PERFORMANCE 15 Dhrystone MIPS/2MFLOPS DP LINPACK
MEMORY 12Mb expandable to 32Mb
DISPLAY MEMORY 1.5 Mb VRAM
DISPLAY 16-bits/pixel colour 4096 colours simultaneously
PORTS 2 Ethernet, 2 RS423 serial, 4.8Mb/sec SCSI port, laser printer for dedicated NeXT laser, digital signal Processor port, MegaPixel colour display port
84 key keyboard
Two button opto-mechanical mouse
Sound box with integrated microphone and speaker. CD quality stereo sound. Headphone jack.
FLOPPY DISK 2.88Mb ED drive
HARD DISK 400Mb 3.5 inch hard drive with 17ms access time. Software preinstalled by NeXT
MONITOR 16 inch viewable (true flat square) 1120x832 resolution at 92dpi 68Hz refresh rate, non interlaced 0.26mm dot pitch
Silica anti-reflective coating
Tilt and swivel stand

SHOULD I BUY ONE?

The cheapest mono NeXT is around £4,000. That's about the price of the Macintosh IIFX, the high end Mac. Workstations start at around the same price as NeXT but don't generally offer as user-friendly an interface.

Now that software is available, the NeXT is a good buy if you want a serious machine that anyone can learn to use. As long as serious software developers continue their support and the user base of 8000 grows, NeXT could set the pace for personal productivity in the 90s that the Mac set in the 80s.
PRICE: NeXTstation (mono) £3,225, colour £5,155, NeXTcube mono £5,155, NeXTdimension colour £9,100, NeXT Laser Printer £1,160 (400dpi)

BUBBLING UNDER

Owners of Amigas and IBM PC and compatibles who enjoyed SSI's *Eye Of The Beholder* will be pleased to know that come this Christmas they can have more of the same with enhancements for good measure - *Eye Of The Beholder II.*

● US Gold has now confirmed that it has acquired the licence to convert Sega's *Sonic The Hedgehog* to the home computers. A team to do the deed has yet to be determined, but a release towards the end of 1992 has been pencilled in. This isn't the first time a Sega console title has changed medium – Core Design converted *Action Fighter* for Firebird over two years ago, and it was likely that others would follow (but they didn't).

Nintendo isn't so open-minded about these things as it views the conversion of its wares to other systems as competition. That's why we won't ever see *Mario* appearing on any home computer format. And yet Sega, on the other hand, has now consented to license its biggest ever release – its potential *Mario* basher – for conversion to rival formats. The home computer incarnations won't appear for at least a year, which means they shouldn't interfere with the Mega Drive version's success. I'm not complaining – well, just so long as the conversions don't turn out to be dogs.

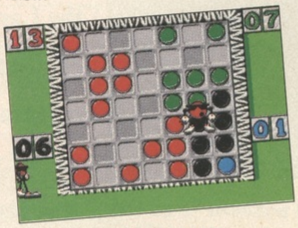
● Good news for Amiga and Atari ST flight 'n' fight simulation fans – Velocity's rather smashing *Jetfighter II* (see Games Week 134) is being converted to the 16-bit machines. The original's author, Bob Dinnerman, is handling the Amiga version (you may recall that Mr D is the man behind Jetfighter II's precursor F/A-18 Interceptor). Expect to see the fruits of his labour at the end of this year.

● Seven or so years ago DataSoft released *Conan* for the Atari 800 and Commodore 64. Well now the man's back, only this with a difference – three of them in fact. Virgin's *Conan The Cimmerian* is based on the character found in Robert E Howard's best-selling novels and takes the form of an FRPG romp with arcade-action undertones, much like *Spirit Of Excalibur* (to which, incidentally, Virgin's producing a sequel entitled *Vengance Of Excalibur*). This fierce barbarian is out to avenge the death of his family and friends who were massacred, by the "ravening hordes of Thoth Amon, high priest of the vile cult of Set". There are over 200 locations, ranging from caverns and inns, crypts and dungeons to temples and tombs. *Conan The Cimmerian* will be released this September on the Amiga and IBM PC and compatibles.

Games Week

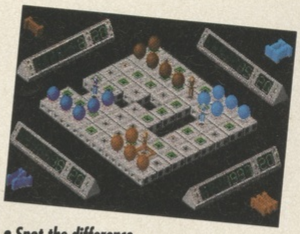
Hubble, bubble, toil and trouble ... that's Gary Penn, with another cute collection of hot news, rave reviews and terrific tips.

Cast your mind back to Games Week 136 (it was only last week) and you may remember a review of Leisure Genius' ***Spot***. "It's original and playable enough to last a lifetime," I said. And it still is, and will continue to be when it eventually appears. Leisure Genius has decided to put back ***Spot***'s release date to August. So now you know.



• It's the Real Thing ... Spot.

Still with Spot ... Someone at ESP was obviously impressed with it too, as the team has written a product in a very similar vein for Electronic Zoo. The Ball Game doesn't look like ***Spot***. And it doesn't play like ***Spot***, but only because its remarkably similar concept hasn't been executed particularly well.

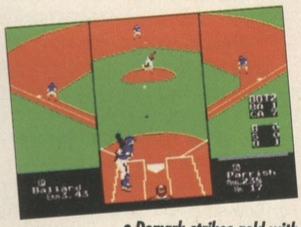


• Spot the difference ... The Ball Game.

The board's presented from an isometric perspective, which is no bad thing. What is poor is the storyline about the elements, which turn out to be four geezers who create coloured balls on the board and collectively behave much like the pieces in **Spot**, and the use of some bizarre random teleportation system (which simply has no place in a game of logic). Suffice it to say, ***The Ball Game*** doesn't represent a worthwhile alternative to ***Spot***. Be patient and wait for the Real Thing.

Baseball isn't anywhere near as popular over here as it is over there, but software publishers keep knocking 'em out for the summer. The latest to appear is Domark's conversion of Tengen's ***RBI 2 Baseball***. I haven't a clue what happened to its predecessor, but I do know that RBI stands for Runs Batted In, which is the number of runs scored for a player in bat – either by him or his team mates. Or something. Every single conversion of RBI (and that includes the 8-bits) is looking good thus far. The arcade action is complemented by a host of unique statistics for every player based on data from a real season. And it plays like a dream – a field of them in fact. As an added bonus there are special ***RBI 2 Baseball*** caps to be found within the 10,000 of the 16-bit boxes.

RBI 2 Baseball should be



• Domark strikes gold with its conversions of **RBI 2 Baseball.** *This is the Commodore 64 version.*

PLAYING TIPS

THE KILLING CLOUD
Imageworks
Amiga

When you are asked for a mission code enter '1 KILLING'. You will now have 28 nets and 29 PUPs to play with.

LIFE & DEATH

Mindscape • Amiga, Atari ST • £25.53

Whatever you want to be in life, be a home computer owner. Even if you can't fulfill the physical or intellectual requirements to become a fighter pilot or a train driver or an astronaut, chances are it's simulated on one home computer format or another and with a little imagination you can live that dream. Within reason, anyway.

Now anyone who has the surgical spirit (ouch) but lacks the patients (double ouch) can have a crack at playing doctors and nurses with this surgeon simulation. Actually, now isn't quite true. *Life & Death* has been available for the IBM PC and compatibles for around three years, and before that there was *The Surgeon* for the Amiga (which, I must confess, I have never actually seen so I cannot offer a comparison). Quite why the Amiga and Atari ST conversions have been so long coming is

▲ *Welcome to the hospital. The rooms in this corridor hold few surprises – just patients, their records and a classroom or sorts.*

▲ *And speaking of patients – here's one we prepared earlier.*

available for all major formats before June is out. The 8-bit versions are priced at £10.99 on cassette and £14.99 on disk, while the 16-bit versions weigh in at £24.99 apiece.

DO ME A LEMON

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Send your queries to:
DO ME A LEMON,
Games Week, *New Computer Express*,
30 Monmouth Street, Bath BA1 2BW ■

PLAYING TIPS

LINE OF FIRE
US Gold
Amiga

When the control options screen is presented type OPERATION FERRET to affect the screen and activate the cheat mode. You should now be invulnerable during play. Pressing any number key from '1' to '0' will access relevant levels.

PLAYING TIPS

STRIDER 2
US Gold
Amiga

Begin play then type SWIFT to make a cheat icon appear. Press 'E' to replenish Strider's energy or 'D' to replenish the Strider Robot's energy.

TOP 10 SIXTEEN-BIT GAMES

THIS WEEK	LAST WEEK	TITLE	PUBLISHER	MACHINE
1	RE	*Lombard RAC Rally*	Hit Squad	ST AG PC
2	RE	*3D Pool*	Mirror Image	ST AG PC
3	RE	*Xenon 2*	Mirror Image	ST AG
4	1	*Lemmings*	Pysgnosis	ST AG PC
5	5	*PGA Tour Golf*	Electronic Arts	AG PCOT
6	RE	*Armour-Geddon*	Psygnosis	ST AG
7	4	*Monkey Island*	US Gold	ST AG
8	2	*Fantasy World Dizzy*	Code Masters	ST AG
9	NE	*Switch Blade 2*	Gremlin Graphics	AG
10	7	*Hero Quest*	Gremlin Graphics	ST AG

ST = Atari ST AG = Commodore Amiga PC = IBM PC or compatible OT = Other
Chart compiled by Gallup. © European Leisure Software Publishers Assoc.

GAMES REVIEW

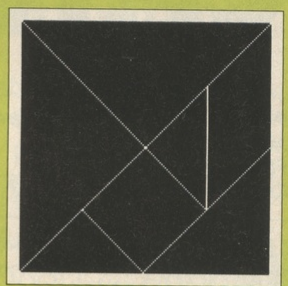
TANGRAM

Thalion • Amiga, Atari ST • £25.53

People are still playing *Tangram*. It's been going on for quite a while – for over 4,000 years apparently. *Tangram* is an ancient Chinese puzzle cum pastime which involves arranging seven geometric shapes to create (supposedly) fascinating patterns. A form of origami for the cack-handed, if you will.

In this computerised version of *Tangram*, Thalion has assembled 200 pictures for you to make. Each one has to be completed within a time limit (determined by the two skill levels) and comes with its own code, to save you playing through the earlier screens to reach the desired one again.

Not that I'd bother playing *Tangram* more than once given a choice. But I did, and I recommend that you don't. Ultimately, this computer incarnation is pointless. (It is however attractively presented with some reasonable features - including a continue option which costs you 250 points a shot). Making your own real life set of *Tangram* shapes is a pizza piece in its self as they are simply derived from a square, and any bookshop worth its salt will have books on the subject full of hundreds of designs. And anyway – *Tangram*'s no more interesting now than it was four millennia ago.



▲ *Make and play with your very own Tangram set by simply cutting along the white lines ...*

▲ *Here's a selection of the patterns you can expect to create in Tangram. Can you see how to fit together the seven pieces to the right of the picture to make the necessary shape and boost your score? You could always play with a second player, but surely no-one could hate anyone enough to ask?*

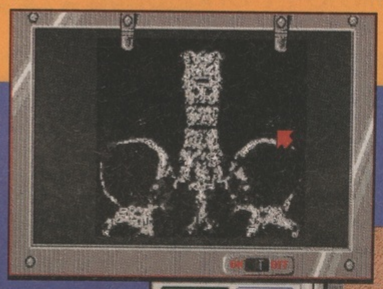
GAMES REVIEW

beyond me. Whatever the reason, *Life & Death* is showing its age. It's also limited in its scope.

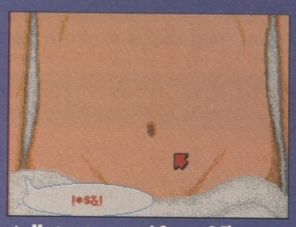
The only part of the body open to you is the abdomen (ho hum), and even then there are few possible operations to attempt and the procedure is far from realistic (not that I have ever had a stab at the Real Thing, but I have seen a few on the telly) or flexible (for example, only one cut is allowed, so butchering the patient is not possible) or, indeed, dextrally challenging. And believe me, when you have successfully performed one appendectomy, you have performed them all.

The surgery is only half the story – in fact, it's rare you get the chance to operate at all. There's some tedious diagnosing to be done by prodding the patient (which is always the same belly) with an arrow (a sample of someone saying 'OUCH!' is played at different speeds whenever you hit the spot, as it were), and a school for novices and failures to attend.

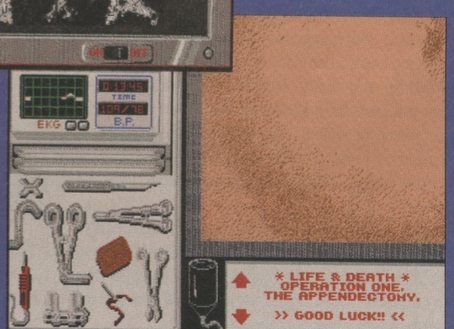
It's a great pity *Life & Death* sounds so promising and yet almost completely fails to deliver the goods. But then, when it boils down to it, a surgeon simulation simply cannot offer any long-term interest anyway. It's one subject which just doesn't make an entertaining simulation. An educational model is the best you could hope for, but *Life & Death* doesn't purport to fill this role either.



▲ *A quick X-ray may be in order - just in case your diagnosis skills are a little suspect.*



▲ *My turn to operate! Operate? There goes his funnybone! That's £200 to me! I'm afraid not. There's no red-nosed patient buzzing in agony here – just an unconvincing tum to slice.*



▲ *A quick prodding tour of the patient's belly region and you are ready to make a diagnosis. Sadly, your chances of being able to operate are slim. More often than not a little medication is all that's required.*

CAN YOU DIGIT?

PRODUCT: Video Digitizer II
MACHINE: Amiga
FROM: Datel Electronics
CONTACT: 0782 744707

Weighing in at less than £100, Datel's new video frame grabber brings real time digitising within the reach of the budget-conscious user. But what kind of sacrifice in quality does such a cheap system offer? Maff Evans plugs in and grabs the real world.

When Rombo released its VIDI frame-grabbing package, a wealth of opportunities opened up for Amiga artists with a tight budget. Other companies began to release similar systems but these were generally of a lower quality unless you wanted to shell out hundreds on a decent set up. Since all these systems were still over £100 (some were as high as £600) the world of video digitising was still out of many people's reach. Now Datel has updated its digitising package and has released it as the Video Digitizer II. Costing less than £90, how does it compare with more expensive pieces of equipment on the market?

WHITE MAGIC BOX

The digitising unit itself is a rectangular box that plugs into the expansion port on the left hand side of the Amiga 500. Amiga 2000 users can also install a basic board inside their machine, wiring the ports out to the back panel. On the front of the unit are LEDs to tell you when the unit is active and when it is actually working, while the back contains the all important controls. As well as a phono socket for accepting a composite video input, there are two ports for controlling the input brightness and contrast. These are a little stiff and fiddly to begin with, but not much adjustment will be needed in practical use.

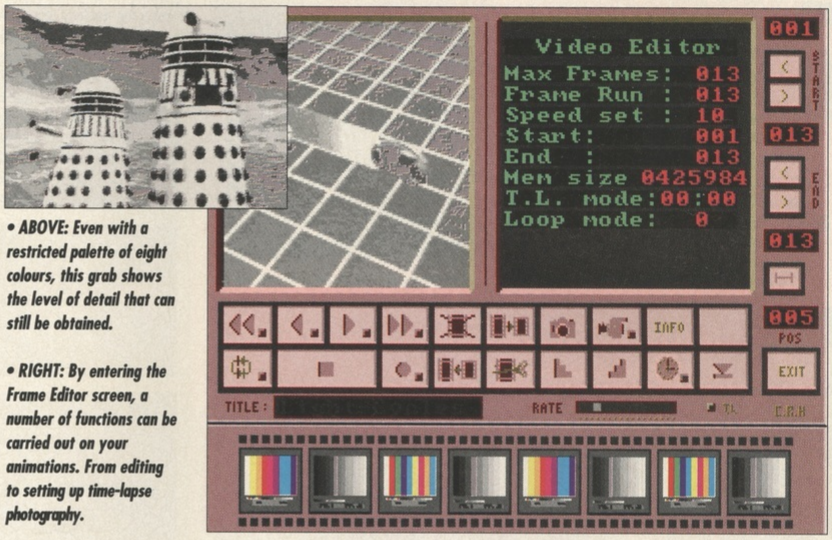
The software is supplied on a single disk, containing the digitising program itself, along with two animation viewers. All the actual grabbing functions are carried out on one screen, with the command icons down the right hand side of the screen. Although this bar can't be turned off, there is a function for saving out grabs as full-screen IFF pictures.

A system which yields excellent results with the minimum of fuss. The ideal starting place for anyone

Grabbing an image is simplicity itself. All you have to do is plug your composite video source into the unit, click on the camcorder icon, adjust your input to get the best picture and finally click on the camera icon. A screen will then be grabbed by the machine and displayed ready for editing. The system works in realtime, so there's no need to mess around with the pause on your video player – the screen will be grabbed instantaneously.

Once you've got your image, you can manipulate it in a number of ways. Functions are available for flipping and rotating a picture, changing its size or even sending it into negative! You can also cut and paste areas of the screen to create a 'photo-montage' effect.

An interesting feature that can be achieved due to the unit's realtime ability is grabbing an animated sequence. If you want to grab an entire sequence, all you have to do is hit the record icon and a series of screens will be grabbed in succession. You can then move to the frame editor screen to cut your animation to the right length, move screens around and set loop and playback speeds.



• ABOVE: Even with a restricted palette of eight colours, this grab shows the level of detail that can still be obtained.

• RIGHT: By entering the Frame Editor screen, a number of functions can be carried out on your animations. From editing to setting up time-lapse photography.

One quite novel addition is the ability to set a delay between grabs, so that you can recreate stop-action films. Just think – you can get a digitised sequence of a flower opening, or even animated pieces of Plasticine like the Morph cartoons.

Unsurprisingly, the number of frames in your digitised sequence is restricted by available memory. About 13 frames is usual on a one meg machine. However, you can reduce the amount of memory taken up by each frame by reducing the number of grey shades in the palette, so that more frames can be crammed in. This gives a marked deterioration in picture quality, but not by so much that a picture becomes unusable.

CRYSTAL CLEAR OR DARK AS MUD?

Seeing as the *Video Digitizer II* is a relatively cheap system, you'd expect to find a few compromises in quality and features. Well, prepare to be surprised! The picture quality is about the best yet seen from a realtime mono grabber. The shades are smooth and glitch free and a surprising amount of detail can be managed even on restricted palettes. One of the most difficult things to grab from video is a scene with a lot of dark shades. Datel's grabber even manages to grab these fairly murky pictures with ease, giving a decent representation of the original in nearly all cases.

Some of the icons may be a little confusing, but the manual briefly explains all the controls so that you don't get too lost. Once you know what's what, grabbing and editing pictures is pretty easy. However, if you can't get to grips with the picture editing controls, the fact that the program allows you to save in IFF format means that you can load them into virtually any paint program you can get your hands on.

For less than £90 for a system which yields excellent results with the minimum of fuss or complication, *Video Digitizer II* represents pretty much the ideal starting place for anyone interested in video grabbing. Now all that's needed is a colour update. How about it Datel? ■

SO, SHOULD YOU SAMPLE AND HOLD? - OR WIPE AND FAST FORWARD?

FOR

▲ Superb picture quality with little fuss, even from dodgy video signals.
▲ Realtime grabbing doesn't rely on the quality of your video's pause function.
▲ Well laid out controls mean that you can start grabbing and editing with little difficulty.
▲ For the price it's an absolute bargain.

AGAINST

▼ The brightness and contrast controls are rather stiff and fiddly, making adjusting the input a drag.
▼ More detailed manual descriptions along with a few tutorial examples would have been extremely helpful.

COST

£89.99 (A500 and A/B2000 available)

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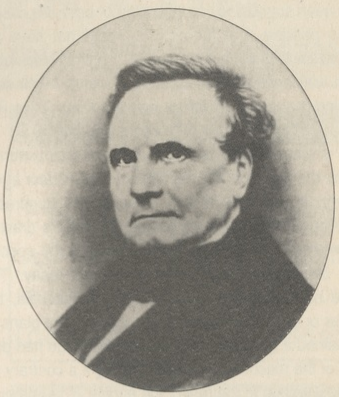


Charles Babbage, inventor of the first computer, never lived to see his creation completed. Only now, 200 years after his birth, has the machine actually been constructed. Duncan McCowan investigates the electronic genius who lived in the steam age.

The trouble with being a genius is that nobody pays you any attention until you're dead. Even then they can take a long time getting round to it. If you're really unlucky you'll be called all sorts of unpleasant names during your lifetime and your real name will be lost to posterity.

All this happened to Charlie Babbage, cruelly known as Barmy Cabbage to his contemporaries at the Royal Society, and it is only now, exactly two hundred years after his birth in 1791, that he is beginning to receive the homage he deserves.

CHARLIE WHO?

Charles Babbage, English mathematician and founder of learned scientific societies, was the first man to conceive and attempt to construct a computer as we understand it today. When we consider our increasing obsession and dependancy on this invention it is staggering to think that there is no Babbage column in London or no Babbage Hall to honour him.

However, the Science Museum in Kensington, London, is currently preparing an exhibition that should drag his name from obscurity and place him firmly up there with the great nineteenth century innovators.

The sheer tedium of addition drove Babbage to consider mechanising calculation. The focus of this exhibition is to be Babbage's Difference Engine No 2, the last of the three calculating machines he designed for the speedy solution of mathematical problems.

He once said to his mate John Herschel, "I wish to God these calculations had been executed by steam," to which his friend replied, "It is entirely possible," sowing the seeds for Babbage's life's work and eternal frustration. He began to make detailed drawings for his engines declaring his aim to eliminate mistakes in the calculating and printing of mathematical tables by mechanising the whole process. Enough of his scientific peers were convinced to warrant a recommendation from the Royal Society and a £1,500 government grant.

The sheer tedium of addition drove Babbage to consider mechanising calculation

In 1823 work on his machine began. After 10 years and £17,000 of public funds (about £450,000 today) the project was abandoned with only a small part of the machine constructed. Unassembled components were sold for scrap and it was about this time that the expression "a right Charlie" came into popular usage.

UNDAUNTED!

Babbage went on to design even more sophisticated machines, notably his Analytical Engine which bore the closest resemblance to today's computers. It consisted of a store for the numbers, a mill to do the calculations, punch card input based on those used in Jacquard looms and a printing unit for the results. It was of the Analytical Engine that Babbage's disciple Lady Lovelace, daughter of Lord Byron and great great grandmother of Linda (and on whom we reckon Babbage spent most of his grant) said, "It can arrange and combine numerical quantities exactly as if they were letters or other general symbols; and, in fact, it might bring out its results in algebraical notation, were provision made accordingly."

This is basically what modern-day computers do; employ the basic functions of computation to abstract forms. Today we use the binary number system, Babbage used the decimal system in his machines.

CONSTRUCTION OF DIFFERENCE ENGINE NO 2

None of Babbage's machines were constructed in his lifetime – his son H P Babbage tried to build part of the Analytical Engine after his father's death, but even this didn't work properly.

It has been the general opinion that Babbage's ideas were too advanced for the technology of his day, that machining was too crude to produce the precision of his drawings and that the spirit of his inventions didn't sufficiently arrouse the imagination of his peers. It has been an essential part of the current project at the Science Museum to show that the Engines could indeed have been made in Babbage's day.

From a study of the many hundreds of drawings left to the museum by his son, experts became increasingly convinced that construction of a Babbage Engine might be possible. This study was first suggested by Dr Anthony Hyman in his biography (*Charles Babbage: Pioneer of the Computer*, Oxford University Press 1982). Dr Allan Bromley of Sydney University also realised while cataloguing the Babbage archive that construction of Difference Engine No 2 might be possible. This engine benefitted from experience gained from the design of the Analytical Engine.

In 1985 Bromley approached the museum with the proposal. The project was extremely well timed, since 1991 was to be the bicentenary of Babbage's birth. It

A MAN OUT OF HIS TIME IN MORE WAYS THAN THAN ONE

The Babbage project is of great importance to all who are interested in the impact of technology, in particular computers, on culture. If we consider that electronic computers now perform precisely those functions of higher mathematics that Babbage envisioned which allow us to construct space craft, it is facinating to think how this process might have accelerated had Babbage himself been successful.

The fact that one of his machines has now been built suggests that it was not technological crudity that hampered their development but lack of support and limited funding. J David Bolter in his book *Turings Man* is sympathetic to Babbage:

"Babbage and his proteges were genuine visionaries. In their writings we often find expressions of a world view fully a century ahead of its time. If the Analytical Engine had been built, it would indeed have been the first computer, but Babbage was trying to fashion out of clockwork a device that really belongs to the age of electronics

"Babbage's blue-prints and disassembled parts could not change the world. His writings give proof of this sad fact: they speak eloquently of instruction steps, programming logic, symbol manipulation, the limits of machine time. Yet the scientists of the age apparently did not feel the significance of the message. Babbage remained a brilliant aberration, a prophet of the electronic age in the heyday of the steam engine".

And Doron Swade, a man who must take a great deal of credit for the Babbage project currently underway, speaks on a more sober note about British attitudes towards innovation.

"Babbage's attempts to achieve a complete engine find strong echoes today; the relationship between entrepreneurial ventures and government, advanced technology and innovation, market needs, peer groupage, valuations, personal emnities and the relationship of the investigative scientist and the establishment.

"He was uncomplementary about the cultural climate for entrepreneurs, an allegation that Britain can innovate but unlike America can't exploit its inventiveness".

CHARLES BABBAGE

THE MAN, THE MACHINE, THE MYTH

has been suggested that had this not been the case it is quite possible that the project would not have gone ahead for lack of impetus. So, but for the British obsession with anniversaries Babbage's name might still be resting in the hall of failure and the Post Office would not consider his face fit for a postage stamp.

A team of experts and technicians was assembled under the direction of Doron Swade, the curator of computing. It was their task to interpret the hundreds of drawings into a workable format. Babbage's drawings, while extremely detailed, lacked much of the specification demanded of engineering designs today. There were no dimensions, specification of materials, tolerances or even numbers of parts needed. The plans also contained a glaringly obvious fault; Babbage had drawn part of the machine backwards, giving it a contrary rotational direction to the rest of the engine. This is a bit like sitting on the handle-bars of a bicycle and trying to steer with the saddle, an error so elementary that it has been sugested that Babbage was trying to safeguard his design with deliberate mistakes.

"I would give up the rest of my life for the privilege of spending three days in the age five hundred years hence!"

Charles Babbage (1791 - 1871)

It was decided that a trial piece should be made to see if the basic design of the machine was sound. This was completed in December 1988. Before construction of the full-scale engine could begin it was essential to know the manufacturing costs. Consulting engineers Rhoden Partners, the same firm that had updated Babbage's drawings, was brought in for this task. The money was to come from sponsorship. In order to reduce costs and time it was decide to omit the printing mechanism. Once funding was assured Rhoden Partners began work on the first steps towards construction. The painstaking attention that every step of this project has been given is born out in the words of Peter Turvey, Project coordinator:

"Paramount was the need to maintain historical authenticity. If the project was to suceed in its aim of demonstrating that Difference Engine No 2 could have been built in Babbage's day, then it was vital to ensure that the materials used, manufacturing methods and accuracy achieved were not incompatible with 1840's technology. Furthermore, any departures from Babbage's original design would have to be very carefully vetted to ensure that they remained true to the spirit of Babbage's design."

Much time was spent deciding on the grades of metal to be used. Electron microscopes were used to analyse parts made by Babbage's engineer in order to find an equivalent for nineteenth century gun-metal.

Everything seemed to be cruising along quite nicely when unexpected disaster struck. Rhoden Partners went bust. Was this the ghost of Charlie's bad luck? The only solution was for the Science Museum to take over the construction mid-stream and on their own premises. It was also plain that to maintain consistency the services of Reg Crick and Barry Holloway, Rhoden's project and procurement engineers, were essential.

One fortunate spin-off from this unhappy event was that the Engine was now to be constructed in full public view at the museum. The various stages of construction have been video recorded and it is hoped that this will prove an interesting record for posterity, showing current methods and manners.

The engine has now just been completed and was awaiting various tests. But in preliminary phonecalls to the director Doron Swade we were given the impression that there was a high level of anxiety as to whether the machine was actually going to work.

"Leave it a couple of weeks before coming along," he said. "Things are pretty tense".

The project was looking to cost about half a million at this stage and the idea of a six month Babbage exhibition without a working Engine was not a handsome prospect. Great sympathy for Babbage, his trials and tribulations, must have developed over the various stages of construction.

REALITY AT LAST

The engine is to be unveiled at the start of the special exhibition which opens at the Science Museum on July 1 and runs for six months.

According to the museum, "It will feature an unrivalled collection of surviving Babbage pieces and selected items of unique archival material. Contemporary calculationg machines on special loan from Sweden will be exhibited for the first time in the United Kingdom." A special room is currently being prepared for this show and the Royal Mail has indeed announced a special commemorating Michael Faraday, the British Physicist, Frank Whittle, the inventor of the jet engine and Watson Watt for his work on radar. So if you're at a loss as to what to get your brother for Christmas look no further. ■

SEE FOR YOURSELF

The Babbage exhibition opens at the Science Museum from July 1st to January 1992. It will cost you £3.50 (Adults), £1.75 (kids) to get into the Museum itself. So if you're at a loss as to how to spend a rainy day this summer, take a trip to the Science Museum and see Babbage's Engine in the flesh, and discover a bit more about the man who was indeed ahead of his time.

• A carry lever, part of the mechanism of the Second Difference Engine which caters for a number when it goes over ten.

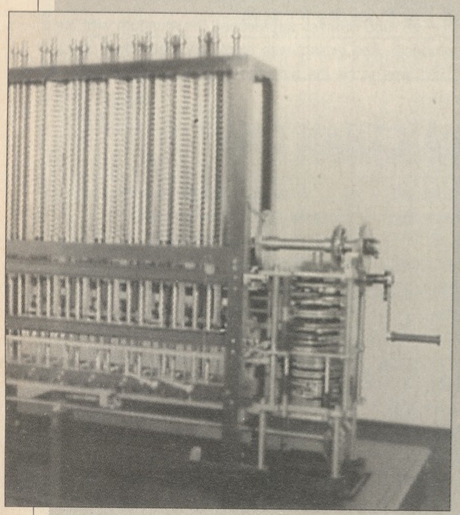
SOUND OF CRUNCHING NUMBERS

When we asked Doron Swade, Project Manager, if we could ask the machine to perform a basic function, say 1234 x 5678 he replied 'it doesn't do multiplications" He explained that the machine works by the process of 'finite differences', a technique which allows complex multiplications and divisions to be performed by simple additions - the mechanisms for doing additions being very much simpler than for that of multiplication and division.

Numbers are fed into the machine by turning and setting the numbered cog-wheels to a cursor. An operating handle is then turned and the result arrives to be read off the final column. Babbage designed the answer to arrive in a complete machine cycle, this being one turn of the handle and taking a matter of seconds. He also designed a print out mechanism which due to reasons of time and economy were left out and replaced with its current device.

However, the Engine could not be described as fully automated. Before it can function, all of its 248 cogs on eight columns must be set by hand! Initial calculations of a given equation must first be done in long hand and the results fed into the machine. It is at this point that the Engine computes, giving its answer to 30 decimal places.

It is easy to see why Babbage's Engine was criticised in its day for not doing the 'whole job'. Babbage could not altogether banish the tedium of higher maths, but if you wanted to find all the values for x in the function $x^7 + x^2 + 41$ with x equalling any number from 75 to 350 then you could do this at the turn of a handle. Modern historians describe a prime function of a computer as number crunching; not only does Babbage's Engine do the work but it makes the noises as well.



THE FIRST MODERN COMPUTER

The engine itself is a terrific structure and a great achievement. It is also bizarre to think that we are looking for the first time at a piece of nineteenth century technology in the late twentieth century. In this sense it is also like some archeological discovery, a hitherto unknown piece of history. Here are some dimensions.

Size	10 feet long, 6 feet high (3.05m, 1.83m)
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• The sheer tedium of addition drove Babbage to mechanising the calculation. His Difference Engine No 2 works out calculations at one turn of the machine's handle and prints out within seconds.

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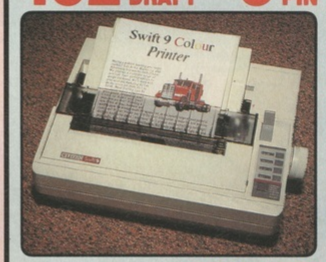

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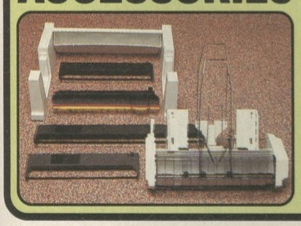

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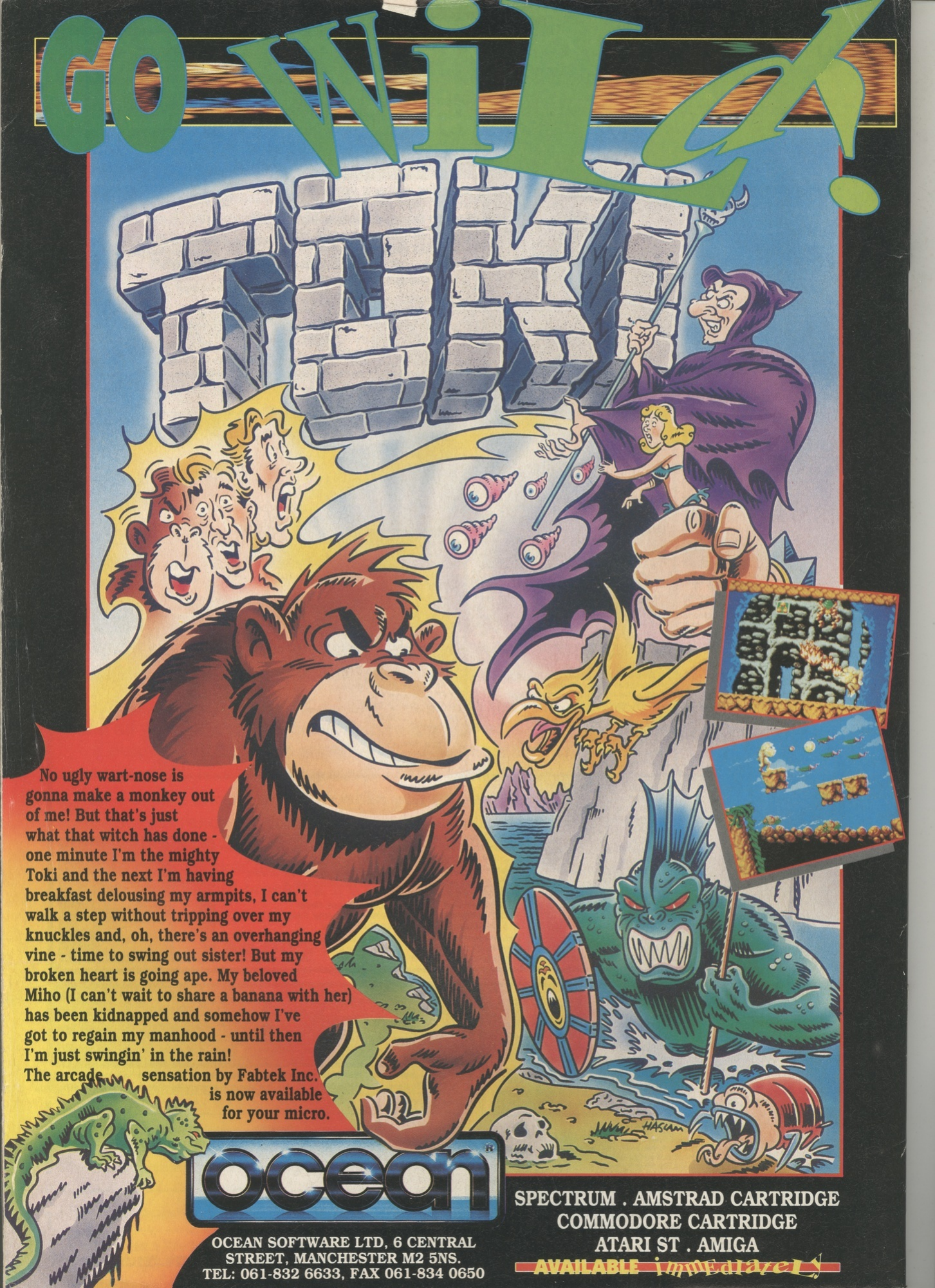

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